Historical UK home computer advertisement collection

Sub-£300 computers only!

This home computer advertisement PDF was put together to show the range of home computers competing in the UK market.

Only computers under £300 inc VAT are included in this particular selection.

So for example, whilst the C64 was available earlier than the earliest advert in this PDF, it has not been Included until the retail price inc VAT dropped below £300

Finally, the adverts included all have some degree of difference, so whilst a certain company may have advertised in a particular year, it will only be present if it's different to the previous year's advert.

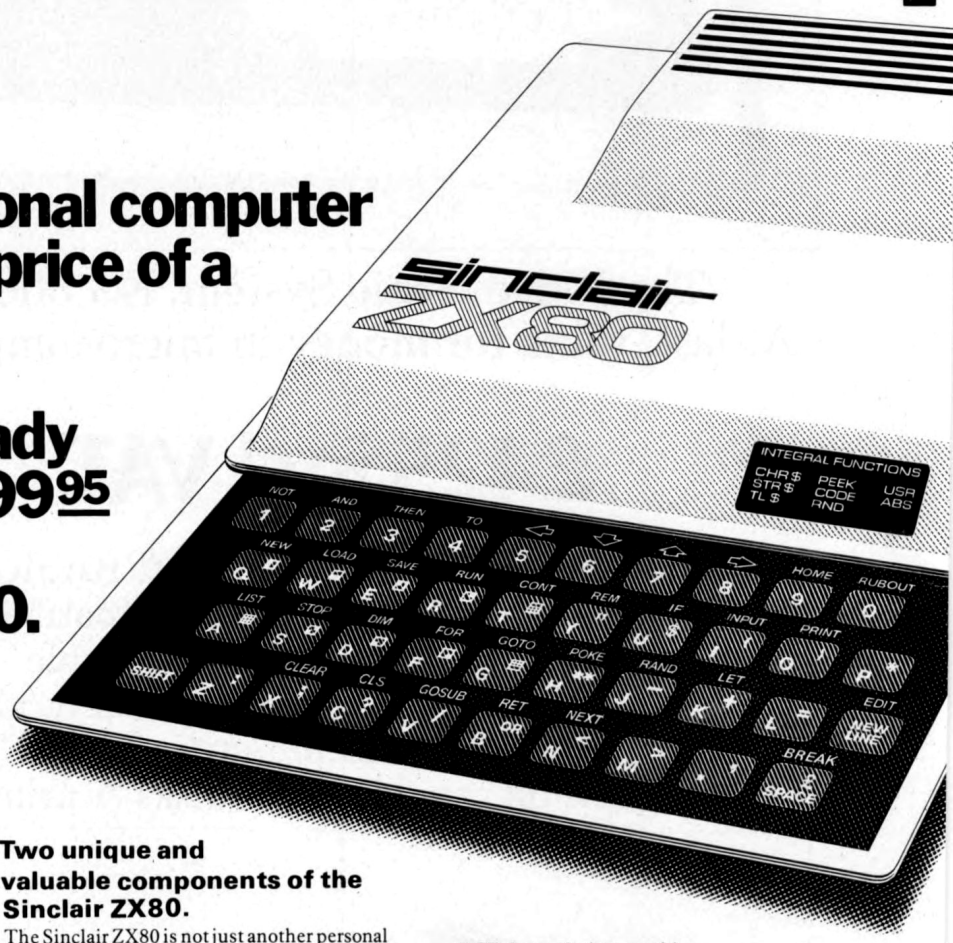
1980

Britain's first comp

A complete personal computer for a third of the price of a bare board.

Also available ready assembled for £99.95

The Sinclair ZX80.



Until now, building your own computer could easily cost around £300 – and still leave you with only a bare board for your trouble.

The Sinclair ZX80 changes all that. For just £79.95 you get *everything* you need to build a personal computer at home... PCB, with IC sockets for all ICs; case; leads for direct connection to your own cassette recorder and television; everything!

And yet the ZX80 really is a complete, powerful, full-facility computer, matching or surpassing other personal computers on the market at several times the price. The ZX80 is programmed in BASIC, and you could use it to do quite literally anything from playing chess to running a power station.

The ZX80 is pleasantly straightforward to assemble, using a fine-tipped soldering iron. Once assembled, it immediately proves what a good job you've done. Connect it to your TV set... link it to an appropriate power source*... and you're ready to go.

Your ZX80 kit contains...

- Printed circuit board, with IC sockets for all ICs.
- Complete components set, including all ICs – all manufactured by selected world-leading suppliers.
- New rugged Sinclair keyboard, touch-sensitive, wipe-clean.
- Ready-moulded case.
- Leads and plugs for connection to any portable cassette recorder (to store programs) and domestic TV (to act as VDU).
- FREE course in BASIC programming and user manual.

Optional extras

- Mains adaptor of 600 mA at 9 V DC nominal unregulated (available separately – see coupon).
- Additional memory expansion board plugs in to take up to 3K bytes extra RAM chips. (Chips also available – see coupon.)

*Use a 600 mA at 9 V DC nominal unregulated mains adaptor. Available from Sinclair if desired (see coupon).

Two unique and valuable components of the Sinclair ZX80.

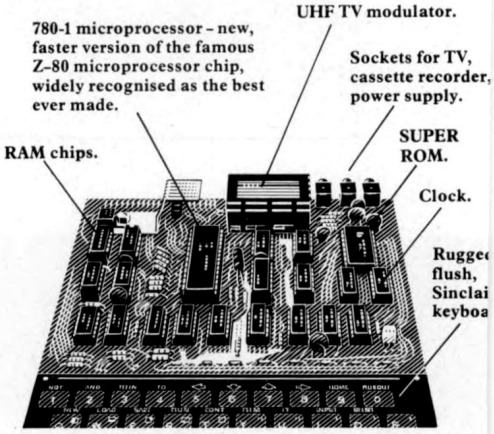
The Sinclair ZX80 is not just another personal computer. Quite apart from its exceptionally low price, the ZX80 has two uniquely advanced components: the Sinclair BASIC interpreter; and the Sinclair teach-yourself BASIC manual.

The unique Sinclair BASIC interpreter... offers remarkable programming advantages:

- **Unique 'one-touch' key word entry: the ZX80 eliminates a great deal of tiresome typing. Key words (RUN, PRINT, LIST, etc.) have their own single-key entry.**
- Unique syntax check. Only lines with correct syntax are accepted into programs. A cursor identifies errors immediately. This prevents entry of long and complicated programs with faults only discovered when you run them.
- Excellent string-handling capability – takes up to 26 string variables of any length. All strings can undergo all relational tests (e.g. comparison). The ZX80 also has string input-to request a line of text when necessary. Strings do *not* need to be dimensioned.
- Up to 26 single dimension arrays.
- FOR/NEXT loops nested up 26.
- Integer names of any length.
- BASIC language also handles full Boolean arithmetic, conditional expressions, etc.
- Exceptionally powerful edit facilities, allows modification of existing program lines.
- Randomise function, useful for games and secret codes, as well as more serious applications.
- Timer under program control.
- PEEK and POKE enable entry of machine code instructions, USR causes jump to a user's machine language sub-routine.
- High-resolution graphics with 22 standard graphic symbols.
- All characters printable in reverse under program control.

...and the Sinclair teach-yourself BASIC manual.

If the features of the Sinclair interpreter listed alongside mean little to you–don't worry. They're all explained in the specially-written 96-page book *free* with every kit! The book makes learning easy, exciting and enjoyable, and represents a complete course in BASIC programming – from first principles to complex programs. (Available separately – purchase price refunded if you buy a ZX80 later.)



lete computer kit.

£79.95

Including VAT.
Including post and packing.
Including all leads and components

Fewer chips, compact design, volume production – more power per pound!

The ZX80 owes its remarkable low price to its remarkable design: the whole system is packed onto fewer, newer, more powerful and advanced LSI chips. A single SUPER ROM, for instance, contains the BASIC interpreter, the character set, operating system, and monitor. And the ZX80's 1K byte RAM is roughly equivalent to 4K bytes in a conventional computer, because the ZX80's brilliant design packs the RAM so much more tightly. (Key words, for instance, occupy just a single byte.)

To all that, add volume production – and you've that rare thing: a price breakthrough that really *is* a breakthrough.

The Sinclair ZX80. Kit: £79.95. Assembled: £99.95. Complete!

The ZX80 kit costs a mere £79.95. Can't wait to have a ZX80 up and running? No problem! It's also available, ready assembled, for only £99.95.

Whether you choose the kit or the ready-made, you can be sure of world-famous Sinclair technology – and years of satisfying use. (Science of Cambridge Ltd is one of the Sinclair companies owned and run by Clive Sinclair.)

To order, complete the coupon, and post to Science of Cambridge for delivery within 28 days. Return as received within 14 days for full money refund if not completely satisfied.

sinclair ZX80

Science of Cambridge Ltd
6 Kings Parade, Cambridge, Cambs., CB2 1SN.
Tel: 0223 311488.

Order Form

To: Science of Cambridge Ltd, 6 Kings Parade, Cambridge, Cambs., CB2 1SN.
Remember: all prices shown *include* VAT, postage and packing. No hidden extras.

Please send me:

Quantity	Item	Item price £	Total £
	Sinclair ZX80 Personal Computer kit(s). Price includes ZX80 BASIC manual, excludes mains adaptor.	79.95	
	Ready-assembled Sinclair ZX80 Personal Computer(s). Price includes ZX80 BASIC manual, excludes mains adaptor.	99.95	
	Mains Adaptor(s) (600 mA at 9 V DC nominal unregulated).	8.95	
	Memory Expansion Board(s) (takes up to 3K bytes).	12.00	
	RAM Memory chips – standard 1K bytes capacity.	16.00	
	Sinclair ZX80 Manual(s) (manual free with every ZX80 kit or ready-made computer).	5.00	
NB. Your Sinclair ZX80 may qualify as a business expense.		TOTAL	£

I enclose a cheque/postal order payable to Science of Cambridge Ltd for £ _____

Please print
Name: Mr/Mrs/Miss _____

Address _____

PCW/3/80

ACORN ATOM

The elegant injection moulded plastic case houses a full size professional keyboard and a hardware/software combination of extraordinary power and versatility; in the minimum price configuration the kit of parts provided allows BASIC *and* ASSEMBLER, graphics and sound output, direct cassette and T.V. interface and much more. Sockets and connectors allow for expansion *within* the case to allow features normally associated with computers costing ten times as much.

Every kit is sent with assembly instructions and a beginners guide to Atom BASIC, ASSEMBLER and operating system.

The basic unit in kit form costs **£120** plus VAT and postage, total £143.00. Prices and details of ready built units and accessories on request. Delivery in beginning of May.

- Fast 32-bit Integer BASIC
- Floating point math routines (10 digit)
- Mnemonic Assembler
- Cassette load and save
- 16 letter file names
- Graphics Plot, Draw and Move
- Screen editor
- Timer function
- Many extended BASIC features

- 192 Graphics characters
- 5 Graphics modes
- High resolution (256 x 192)
- Internal speaker
- Printer output
- UHF output
- Monitor output
- Colour output
- Communication loop
- Cassette I/O
- 24 User I/O lines
- Internal socket for any Acorn card
- Acorn bus output

ACORN COMPUTER

Acorn Computer Ltd.,
4a Market Hill,
Cambridge, CB2 3NJ
Tel. (0223) 312772

Unique in concept - the home computer that grows as you do!

New! - The Acorn Atom

£120 plus VAT and p&p.

An outstanding personal computer kit

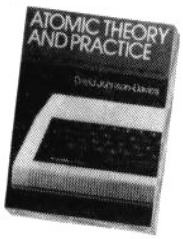
Also available ready-built **£150** plus VAT and p&p

The ATOM – a definitive personal computer. Simple-to-build, simple-to-operate. But a really powerful full-facility computer. And designed on an expandable basis. You can buy a superb expanded package now – tailored to your needs. Or, you can buy just the standard Atom kit, and, as you grow in confidence and knowledge, add more chips. No need to replace your equipment. No need to worry that your investment will be overtaken by new technology. As you need more power, more facilities, you can add them!

*The picture shown demonstrates mixed graphics and characters in three shades of grey provided by the Standard Atom.

The standard ATOM kit includes:

● Full sized QWERTY keyboard ● Rugged polystyrene case ● Fibreglass PCB ● 2K RAM ● 8K ROM ● 23 integrated circuits ● Full assembly instructions including tests for fault-finding. (Once built, connect it to any domestic TV and power source) ● Power requirement: 8V at 800 M A. ATOM power unit available. See coupon. PLUS FREE MANUAL written in two sections – teach yourself BASIC and machine code for those with no knowledge of computers, and a reference section giving a complete description of the ATOM's facilities. All sections are fully illustrated with example programs.



The ATOM concept

Adding chips into sockets on the PCB allows you to progress in affordable steps to large-scale expansion. You can see from the specifications that the RAM can be increased to 12K allowing high resolution (256 x 192) graphics. Two further ROM chips, e.g. maths functions, can be added directly to the board giving a 16K capacity. In addition to 5 I/O lines partly used by the cassette interface, an optional VIA device can provide varied I/O and timer functions and via a buffer device allow direct printer drive. An optional module provides red, green and blue signals for colour. An in-board connector strip takes the ATOM communications loop interface. Any number of ATOMs may be linked to each other – or to a master system with mass storage/hard copy facility. Interface with other ACORN cards is simplicity itself. Any one ACORN card may be fitted internally.

So you can see there are a vast number of modular options and additions available, expanding with your ability and your budget.

The ATOM hardware includes:

● Memory from 2K to 12K RAM on board (up to 35K in case) ● 8K to 16K ROM (two 4K additions) ● 6502 processor ● Video Display allows high resolution (256 x 192) graphics and red, green and blue output ● Cassette Interface – CUTS 300 baud ● Loudspeaker allows tone generation of any frequency ● Channel 36 UHF Modulator Output ● Bus output includes internal connections for Acorn Eurocard.

The ATOM software includes:

● 32-bit arithmetic (±2,000,000,000) ● High speed execution ● 43 standard/extended BASIC commands ● Variable length strings (up to 256 characters) ● String manipulation functions ● 27 32-bit integer variables ● 27 additional arrays ● random number function ● PUT and GET byte ● WAIT command for timing ● DO-UNTIL construction ● Logical operators (AND, OR, EX-OR) ● LINK to machine-code routines ● PLOT DRAW and MOVE.

ACORN COMPUTER 4a Market Hill, CAMBRIDGE CB2 3NJ

Your ACORN ATOM may qualify as a business expense. To order complete the coupon below and post to Acorn Computer for delivery within 28 days. Return as received within 14 days for full money refund if not completely satisfied. **All components are guaranteed with full service/repair facility available.**

Please send me the following items:

Quantity	Item		Item price inc. VAT+p&p	TOTALS
	ATOM KIT 8K + 2K (MIN)		@ £140.00	
	ATOM ASS 8K + 2K (MIN)		@ £174.50	
	ATOM KIT 12 + 12K (MAX)		@ £255.00	
	ATOM ASS 12 + 12K (MAX)		@ £289.50	
	1K RAM SETS		@ £11.22	
	4K FLOATING POINT ROM		@ £23.30	
	PRINTER DRIVE	6522 VIA	@ £10.35	
		LS 244 Buffer	@ £3.17	
	MAINS POWER SUPPLY (1.5 amps)		@ £10.20	
			TOTAL	

To: Acorn Computer Ltd., 4a Market Hill, CAMBRIDGE CB2 3NJ

I enclose cheque/postal order for £ _____

Please debit my Access/Barclaycard No. _____

Signature _____

Name (Please print) _____

Address _____

Telephone No. _____

Registered No: 1403810. VAT No: 215 400 220 PCW/7/80

Britain's first com
computer kit.

The Sinclair ZX80.

£79.95

Price breakdown
ZX80 and manual: £69.52
VAT: £10.43
Post and Packing FREE

Please note: many kit makers quote VAT-exclusive prices.

You've seen the reviews... you've heard the excitement... now make the kit!

This is the ZX80. 'Personal Computer World' gave it 5 stars for 'excellent value.' Benchmark tests say it's faster than all previous personal computers. And the response from kit enthusiasts has been tremendous.

To help you appreciate its value, the price is shown above with and without VAT. This is so you can compare the ZX80 with competitive kits that don't appear with inclusive prices.

'Excellent value' indeed!

For just £79.95 (*including* VAT and p&p) you get everything you need to build a personal computer at home... PCB, with IC sockets for all ICs; case; leads for direct connection to a cassette recorder and television (black and white or colour); *everything*!

Yet the ZX80 really is a complete, powerful, full-facility computer, matching or surpassing other personal computers at several times the price.

The ZX80 is programmed in BASIC, and you can use it to do quite literally anything from playing chess to managing a business.

The ZX80 is pleasantly straightforward to assemble, using a fine-tipped soldering iron. It immediately proves what a good job you've done: connect it to your TV... link it to an appropriate power source... and you're ready to go.

Your ZX80 kit contains...

- Printed circuit board, with IC sockets for all ICs.
- Complete components set, including all ICs – all manufactured by selected world-leading suppliers.
- New rugged Sinclair keyboard, touch-sensitive, wipe-clean.
- Ready-moulded case.
- Leads and plugs for connection to domestic TV and cassette recorder. (Programs can be SAVEd and LOADed on to a portable cassette recorder.)
- FREE course in BASIC programming and user manual.

Optional extras

- Mains adaptor of 600 mA at 9 V DC nominal unregulated (available separately – see coupon).
- Additional memory expansion boards allowing up to 16K bytes RAM. (Extra RAM chips also available – see coupon).

*Use a 600 mA at 9 V DC nominal unregulated mains adaptor. Available from Sinclair if desired (see coupon).

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- Timer under program control.
- PEEK and POKE enable entry of machine code instructions, USR causes jump to a user's machine language sub-routine.
- High-resolution graphics with 22 standard graphic symbols.
- All characters printable in reverse under program control.
- Lines of unlimited length.

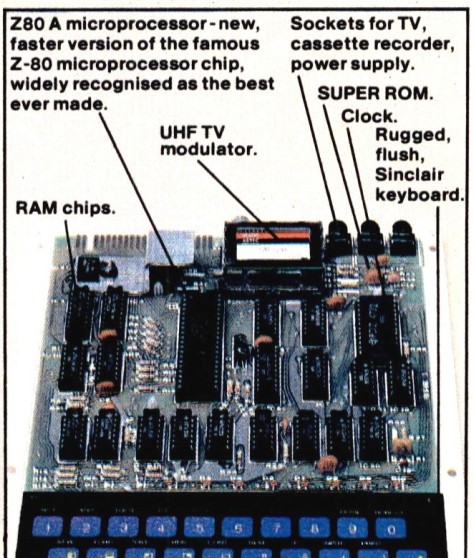
Fewer chips, compact design, volume production – more power per pound!

The ZX80 owes its remarkable low price to its remarkable design: the whole system is packed on to fewer, newer, more powerful and advanced LSI chips. A single SUPER ROM, for instance, contains the BASIC interpreter, the character set, operating system, and monitor. And the ZX80's 1K byte RAM is roughly equivalent to 4K bytes in a conventional computer – typically storing 100 lines of BASIC. (Key words occupy only a single byte.)

The display shows 32 characters by 24 lines.

And Benchmark tests show that the ZX80 is faster than all other personal computers.

No other personal computer offers this unique combination of high capability and low price.



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The Sinclair teach-yourself BASIC manual.

If the features of the Sinclair interpreter mean little to you – don't worry. They're all explained in the specially-written 128-page book *free* with every kit! The book makes learning easy, exciting and enjoyable, and represents a complete course in BASIC programming – from first principles to complex programs. (Available separately – purchase price refunded if you buy a ZX80 later.) A hardware manual is also included with every kit.

The Sinclair ZX80. Kit: £79.95. Assembled: £99.95. Complete!

The ZX80 kit costs a mere £79.95. Can't wait to have a ZX80 up and running? No problem! It's also available, ready assembled, for only £99.95.

Demand for the ZX80 is very high: use the coupon to order today for the earliest possible delivery. All orders will be despatched in strict rotation. We'll acknowledge each order by return, and tell you exactly when your ZX80 will be delivered. If you choose not to wait, you can cancel your order immediately, and your money will be refunded at once. Again, of course, you may return your ZX80 as received within 14 days for a full refund. We want you to be satisfied beyond all doubt – and we have no doubt that you will be.

sinclair ZX80

Science of Cambridge Ltd

6 Kings Parade, Cambridge, Cambs., CB2 1SN
Tel: 0223 311488.

ORDER FORM

To: Science of Cambridge Ltd, 6 Kings Parade, Cambridge, Cambs., CB2 1SN.
Remember: all prices shown *include* VAT, postage and packing. No hidden extras.
Please send me:

Quantity	Item	Item price £	Total £
	Sinclair ZX80 Personal Computer kit(s). Price includes ZX80 BASIC manual, excludes mains adaptor.	£79.95	
	Ready-assembled Sinclair ZX80 Personal Computer(s). Price includes ZX80 BASIC manual, excludes mains adaptor.	£99.95	
	Mains Adaptor(s) (600 mA at 9 V DC nominal unregulated).	8.95	
	Memory Expansion Board(s) (each one takes up to 3K bytes).	12.00	
	RAM Memory chips – standard 1K bytes capacity.	16.00	
	Sinclair ZX80 Manual(s) (manual free with every ZX80 kit or ready-made computer).	5.00	

NB. Your Sinclair ZX80 may qualify as a business expense. **TOTAL £**

I enclose a cheque/postal order payable to Science of Cambridge Ltd for £_____

Please print

Name: Mr/Mrs/Miss_____

Address_____

_____ PCW6

The b

TRS-80 Model I
from **£379**
4K Level I
£559
16K Level II
(illustrated).

TRS 80 Model I Microcomputer Here's the push button brain, the entertainer, the tutor, the timesaver. Fun for the children, a helper for the businessman and the teacher, a catalogue for the housewife, an analyser for the investor and an informer for the salesman.
Run Maths, English, Chess, Draughts and video game programmes for educational fun.
Easy to learn and operate — you can even write your own programmes. Suddenly you have a ready and reliable source of brainpower — put it to work immediately.

TRS 80 Model I C.P.U.'s Complete and ready to run from your TV monitor. Just plug in and start computing. The lowest priced 4 K level I CPU contains 4096 bytes of user memory and can be expanded to 16K within the keyboard unit. The 16K level II CPU is a more powerful and flexible version using an additional 12K ROM. Level II also incorporates a calculator style numeric keypad for faster data entry.

rains.

RS 80 Model II Microcomputer A bigger, more powerful brother to Model I. Designed for more data storage and versatility. Like Model I is completely modular allowing easy, plug-in expansion. It's available memory will allow maximum use of future languages.

RS-80 COMPUTER CENTRES NOW OPEN AT—
Birmingham—Edgbaston Shopping Precinct, Hagley Road.
Bradford—214, Forster Square.
Bristol—Colston Centre, Colston Avenue.
London—1-2, Seacoal Lane, Ludgate Hill, EC4.
111, Kingsway, WC2.
Manchester—30, Market Place, Deansgate.
Southampton—East Street Centre.

FULL COMPUTER FACILITIES AVAILABLE AT—
Dowend—5, Badminton Road, Downend, Bristol.
Leeds—72, Merrion Centre.
Liverpool—168, Market Way, St. Johns Centre.
Wednesbury—Bilston Road.
Wimbledon—124-126, The Broadway, London, SW19.

*All prices include VAT.

IT'S POSSIBLE, ONLY AT Tandy

Better Equipment. Lower Prices. No Middlemen.

Unique in concept—the home computer that grows as you do!

The Acorn Atom

£120

plus VAT and p&p

Also available ready-built **£150** plus VAT and p&p

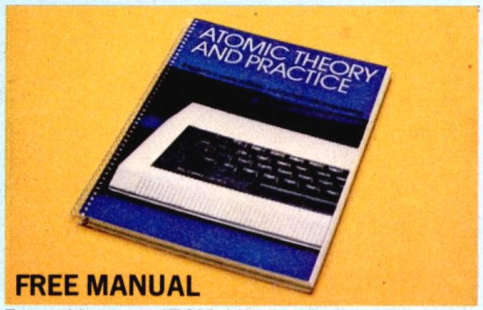
● The picture shows mixed graphics and characters in three colours

Special features include

* FULL SIZED KEYBOARD
* ASSEMBLER AND BASIC
* TOP QUALITY MOULDED CASE
* HIGH RESOLUTION COLOUR GRAPHICS*

* optional

The Acorn Atom is a definitive personal computer. Simple to build, simple to operate. A powerful, full facility computer with all the features you would expect.
Just connect the assembled computer to any domestic TV and power source and you are ready to begin. (Power requirement: 8V at 800mA). There is an ATOM power unit available – see the coupon below.



FREE MANUAL

Free with every ATOM, kit or built, is a computer manual. The first section explains and teaches you BASIC, the language that most personal computers and the ATOM operate in. The instructions are simple and learning quickly becomes a pleasure. You'll soon be writing your own programs. The second section is a reference manual giving a full description of the ATOM's facilities and how to use them. Both sections are fully illustrated with example programs.

The standard ATOM includes:

HARDWARE

● Full-sized QWERTY keyboard ● 6502 Microprocessor ● Rugged injection-moulded case ● 2K RAM ● 8K HYPER-ROM ● 23 integrated circuits and sockets ● Audio cassette interface ● UHF TV output ● Full assembly instructions

SOFTWARE

● 32-bit arithmetic (±2,000,000,000) ● High speed execution ● 43 standard/extended BASIC commands ● Variable length strings (up to 256 characters) ● String manipulation functions ● 27 x 32 bit integer variables ● 27 additional arrays ● Random number function ● PUT and GET byte ● WAIT command for timing ● DO-UNTIL construction ● Logical operators (AND, OR, EX-OR) ● Link to machine – code routines ● PLOT commands, DRAW and MOVE

The ATOM modular concept

The ATOM has been designed to grow with you. As you build confidence and knowledge you can add more components. For instance the next stage might be to increase the ROM and RAM on the basic ATOM from 8K + 2K to 12K + 12K respectively. This will give you a direct printer drive, floating point mathematics, scientific and trigonometric functions, high resolution graphics.

From there you can expand indefinitely. Acorn have produced an enormous range of compatible PCB's which can be added to your original computer. For instance:
● A module to give red, green and blue colour signals ● Teletext VDU card (for Prestel and Ceefax information) ● An in-board connector for a communications loop interface – any number of ATOMs may be linked to each other – or to a master system with mass storage/hard copy facility ● Floppy disk controller card. For details of these and other additions write to the address below.

ACORN COMPUTER 4a Market Hill, CAMBRIDGE CB2 3NJ

Your ACORN ATOM may qualify as a business expense. To order complete the coupon below and post to Acorn Computer for delivery within 28 days. Return as received within 14 days for full money refund if not completely satisfied. **All components are guaranteed with full service/repair facility available.**

Please send me the following items:

Quantity	Item		Item price inc. VAT+p&p	TOTALS
	ATOM KIT – 8K ROM + 2K RAM (MIN)		@ £140.00	
	ATOM ASSEMBLED–8K ROM+2K RAM (MIN)		@ £174.50	
	ATOM KIT – 12K ROM + 12K RAM (MAX)		@ £255.00	
	ATOM ASSEMBLED–12K ROM+12K RAM (MAX)		@ £289.50	
	1K RAM SETS		@ £11.22	
	4K FLOATING POINT ROM (inc in 12K Version)		@ £23.30	
	PRINTER DRIVE	6522 VIA	@ £10.35	
	(inc in 12K version)	LS244 Buffer	@ £3.17	
	MAINS POWER SUPPLY (1.3 amps)		@ £10.20	
			TOTAL	

To: Acorn Computer Ltd., 4a Market Hill, CAMBRIDGE CB2 3NJ

I enclose cheque/postal order for £ _____

Please debit my Access/Barclaycard No. _____

Signature _____

Name (Please print) _____

Address _____

Telephone No. _____

Registered No: 1403810. VAT No: 215 400 220

PCW/9/80

1981

Why the Sinclair ZX80 is Britain's best selling

Built: £99.95

Including VAT, post and packing, free course in computing, free mains adaptor.

Kit: £79.95

Including VAT, post and packing, free course in computing.

This is the ZX80. A really powerful, full-facility computer, matching or surpassing other personal computers at several times the price. 'Personal Computer World' gave it 5 stars for 'excellent value'. Benchmark tests say it's faster than all previous personal computers.

Programmed in BASIC – the world's most popular language – the ZX80 is suitable for beginners and experts alike. And response from enthusiasts has been tremendous – over 20,000 ZX80s have been sold so far!

Powerful ROM and BASIC interpreter

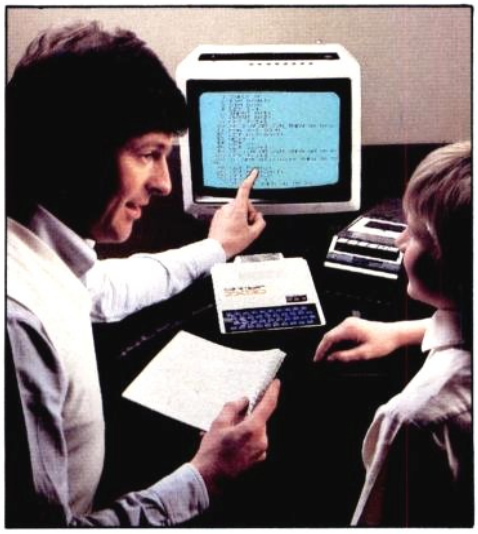
The 4K BASIC ROM offers remarkable programming advantages:

* Unique 'one-touch' key word entry: the ZX80 eliminates a great deal of tiresome typing. Key words (RUN, PRINT, LIST, etc.) have their own single-key entry.
* Unique syntax check. A cursor identifies errors immediately.
* Excellent string-handling capability – takes up to 26 string variables of any length. All strings can undergo all relational tests (e.g. comparison).
* Up to 26 single dimension arrays.
* FOR/NEXT loops nested up to 26.
* Variable names of any length.
* BASIC language also handles full Boolean arithmetic, conditional expressions, etc.
* Randomise function, useful for games and secret codes, as well as more serious applications.
* Timer under program control.
* PEEK and POKE enable entry of machine code instructions.
* High-resolution graphics.
* Lines of unlimited length.

Unique RAM

The ZX80's 1K-BYTE RAM is the equivalent of up to 4K BYTES in a conventional computer – typically storing 100 lines of BASIC.

No other personal computer offers this unique combination of high capability and low price.



The ZX80 as a family learning aid. Children of 10 years and upwards are quick to understand the principles of computing – and enjoy their personal computer.

The Sinclair teach-yourself BASIC manual

If the specifications of the Sinclair ZX80 mean little to you – don't worry. They're all explained in the specially-written 128-page book (free with every ZX80). The book makes learning easy, exciting and enjoyable, and represents a complete course in BASIC programming – from first principles to complex programs.

Kit or built – it's up to you

In kit form, the ZX80 is pleasantly easy to assemble, using a fine-tipped soldering iron. And you may already have a suitable mains adaptor – 600 mA at 9V DC nominal unregulated. If not, see the coupon.

Both kit and built versions come complete with all necessary leads to connect to your TV (colour or black and white) and cassette recorder. Plug in and you're ready to go. (Built versions come with mains adaptor.)

personal computer.

Now available for the ZX80... New 16K-BYTE RAM pack

Massive add-on memory. Only £49.95.

The new 16K-BYTE RAM pack is a complete module designed to provide you – and your Sinclair ZX80 – with massive add-on memory. You can use it for those really long and complex programs – or as a personal database. (Yet it can cost as little as half the price of competitive add-on memory for other computers.)

For example, you could write an interactive or 'conversational' program to show people what your ZX80 can do. With 16K-BYTES of RAM, they could be talking to your computer for hours!

Or you can store a mass of data – perhaps in a fairly simple program – such as a name and address list, or a telephone directory.

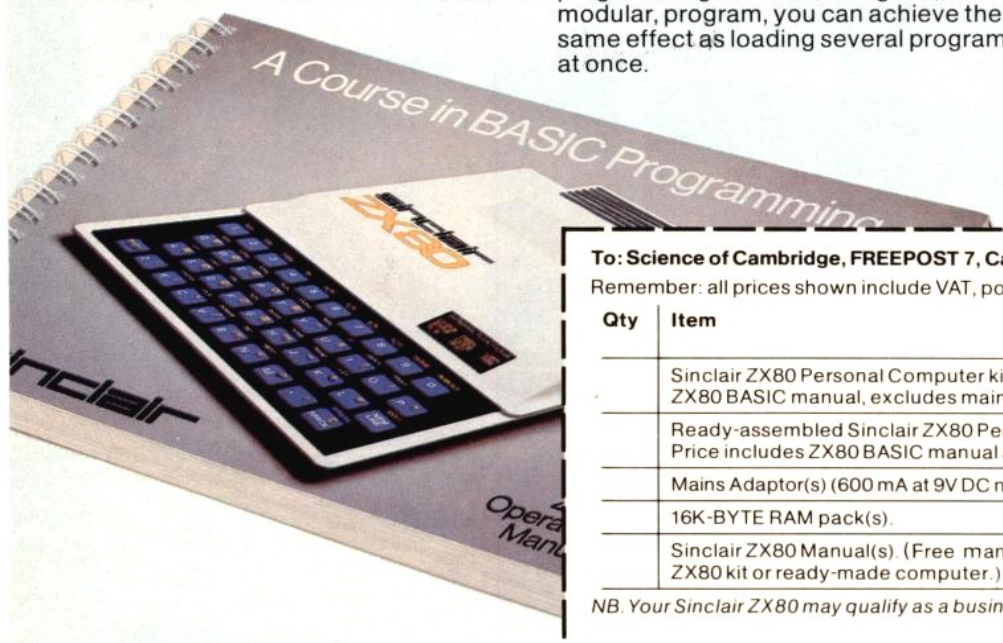
And by linking a number of separate programs together into one giant, but modular, program, you can achieve the same effect as loading several programs at once.

We're also confident that it won't be long before you can buy cassette-based software using the full 16K-BYTE RAM. So keep an eye on the personal computer magazines – and brush up your chess perhaps!

The RAM pack simply plugs into the existing expansion port on the rear of the ZX80. No wires, no soldering. It's a matter of seconds and you don't need another power supply. You can only add one RAM pack to your ZX80 – but with 16K-BYTES who could want more!

How to order

Demand for the ZX80 exceeds all other personal computers put together! So use the coupon to order today for the earliest possible delivery. All orders will be despatched in strict rotation. We'll acknowledge each order by return, and tell you exactly when your ZX80 will be delivered. If you choose not to wait, you can cancel your order immediately, and your money will be refunded at once. Again, of course, you may return your ZX80 as received within 14 days for a full refund. We want you to be satisfied beyond all doubt – and we have no doubt that you will be.



To: Science of Cambridge, FREEPOST 7, Cambridge CB2 1YY.

Remember: all prices shown include VAT, postage and packing. No hidden extras. Please send me:

Qty	Item	Code	Item price £	Total £
	Sinclair ZX80 Personal Computer kit(s). Price includes ZX80 BASIC manual, excludes mains adaptor.	02	79.95	
	Ready-assembled Sinclair ZX80 Personal Computer(s). Price includes ZX80 BASIC manual and mains adaptor.	01	99.95	
	Mains Adaptor(s) (600 mA at 9V DC nominal unregulated).	03	8.95	
	16K-BYTE RAM pack(s).	18	49.95	
	Sinclair ZX80 Manual(s). (Free manual with every ZX80 kit or ready-made computer.)	06	5.00	

NB. Your Sinclair ZX80 may qualify as a business expense. **TOTAL: £**

I enclose a cheque/postal order payable to Science of Cambridge Ltd for £ _____

Please print

Name: Mr/Mrs/Miss _____

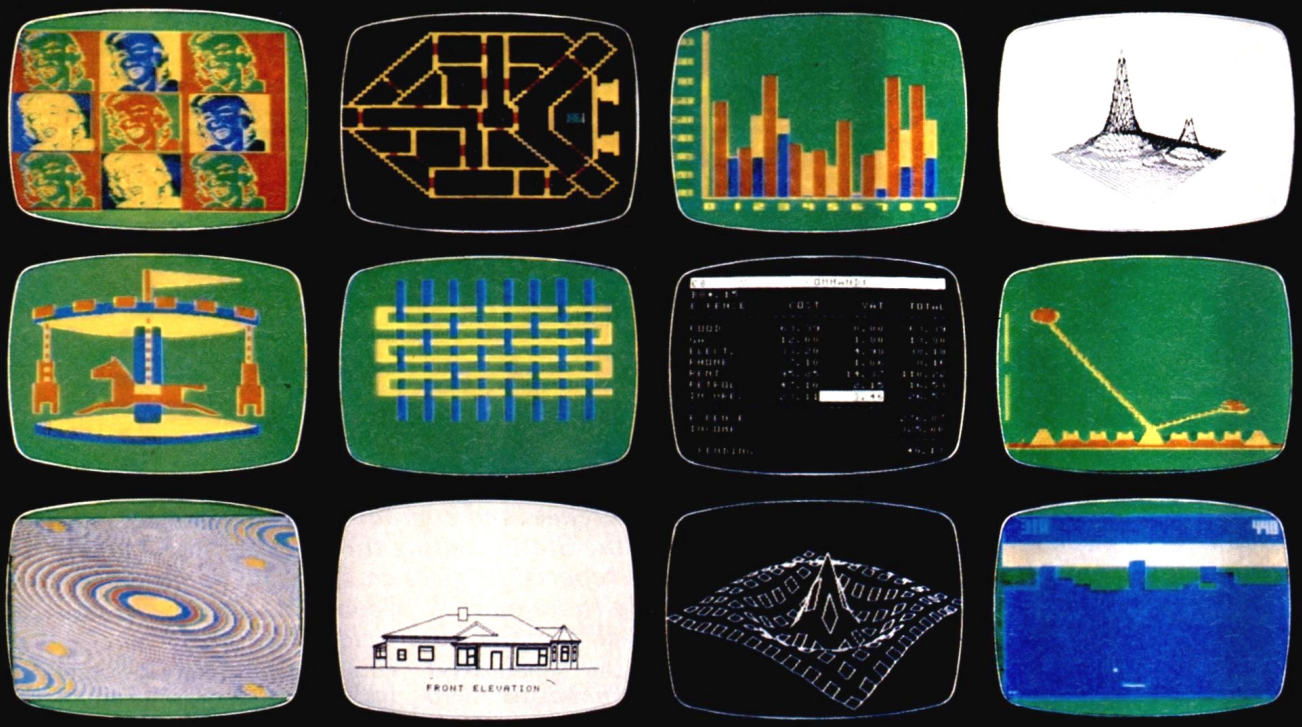
Address _____

FREEPOST – no stamp needed. PCW/1

sinclair ZX80

Science of Cambridge Ltd.

6 Kings Parade, Cambridge, Cambs., CB2 1SN. Tel: 0223 311488.



CHOOSE *ATOM* POWER

At work or play – everything you need in a personal computer

The Atom is a machine to be used. Every day, day after day. It's a full function machine – check the specification against others. It's rugged, easy to operate built to last and features a full-size typewriter keyboard.

Just look at some of the features!

- More hardware support than any other microcomputer
- Superfast BASIC – can be updated to BBC BASIC if required
- High resolution and comprehensive graphics ideal for games programmers and players*
- Integral printer connection*
- Software available for games, education, maths, graphs, business, word processing, etc.
- Other languages: Pascal, FORTH, LISP
- I/O port for control of external devices
- Built-in loudspeaker
- Cassette interface
- Full service/repair facility
- Users club

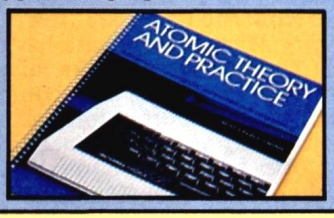
* Expanded version only

Optional Extras

- Network facility with Econet
- Disk
- PAL UHF colour encoder
- Add-on cards include 32K memory, analogue to digital, viewdata VDU, disk controller, daisywheel printer, plus many, many more!
- Power supply

FREE MANUAL

The Atom's highly acclaimed manual comes free with every Atom and leaves nothing out. In just a while you'll be completely at ease with your new machine! Within hours you'll be writing your own programs.



YOU AND YOUR CHILDREN

More and more schools are buying Atoms. More and more children will learn on an Atom. You can give them that extra familiarity with an Atom in the home.

ACORN COMPUTER
4a Market Hill,
CAMBRIDGE CB2 3NJ

When you order your Atom we will include full details of all software packs and the optional hardware.

To: Acorn Computer Limited, 4A Market Hill, Cambridge CB2 3NJ.

I enclose a cheque/postal order for £.....

Please debit my Access/

Barclaycard No .....

Signature .....

Name (please print).....

Address .....

.....

Telephone Number .....

Registered No. 1403810 VAT No. 215 4002 20

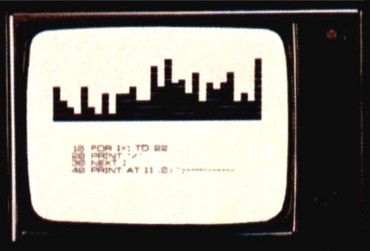
Quantity	Item	Item price inc. VAT + P&P	Totals
	Atom Kit 8K ROM + 2K RAM	@ £140.00	
	Atom Assembled 8K ROM + 2K RAM	@ £174.50	
	Atom Assembled 12K ROM + 12K RAM	@ £289.50	
	Power Supply	@ £ 10.20	
		TOTAL	

Dealers or Mail Order

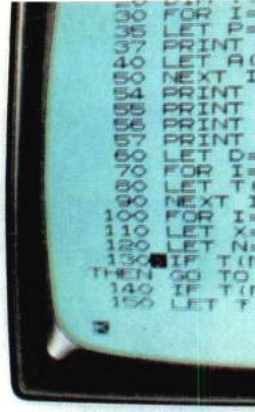
Computer stores are stocking Atoms – there's a list below, but if you have any problems getting hold of one just fill in the coupon and we'll rush one to you within 28 days. If the machine isn't all you expected, or all we've told you, just return it within 14 days for a full refund.

MOM, Aberdeen 22863. Broadway Electronics, Bedford. Owl Computers, Bishops Stortford, 52682. Eltec Services, Bradford 491371. Gamer, Brighton 698424. Electronic Information Systems, Bristol 774564. Cambridge Comp Store, Cambridge 65334. Cardiff Micros, Cardiff 373072. Emprise, Colchester 865926. Silicon Centre, Edinburgh 332 5277. Esco Computing, Glasgow 204 1811. Control Universal, Harlow 31604. Unitron Electronics, Haslington. Castle Electronics, Hastings 437875. Currys Micro Systems, High Wycombe. Microdigital, Liverpool 236 0707. Barrie Electronics, London 488 3316. Off Records, SW12. Technomatic, NW10 452 1500. H.C.C.S., Low Fell 821924. NSC Comp Shops, Manchester 832 2269. Compshop, New Barnet 441 2922. Newbear Comp Store, Newbury 30505. Newcastle Comp Services, Newcastle 615325. Anglia Comp Store, Norwich 29652. Leasalink Viewdata, Nottingham 396976. Customized Elect, Redcar 481460. Computers for All, Romford 751906. Intelligent Artefacts, Royston, Arrington 689. Quadraphenia, Sheffield 77824. Q-TEK Systems, Stevenage 65385. 3D Computers, Surbiton (01) 337 4317. Computer Supplies, Swansea 290047. Abacus Micro Comp, Tonbridge, Paddock Wood 3861. Northern Comp, Warrington 601683.

sinclair ZX81 PERSONAL COMPUTER



New! Sinclair ZX81 Personal Computer.



Kit: £49.95 complete

Reach advanced computer comprehension in a few absorbing hours

1980 saw a genuine breakthrough – the Sinclair ZX80, world's first complete personal computer for under £100. At £99.95, the ZX80 offered a specification unchallenged at the price.

Over 50,000 were sold, and the ZX80 won virtually universal praise from computer professionals.

Now the Sinclair lead is increased: for just £69.95, the new Sinclair ZX81 offers even more advanced computer facilities at an even lower price. And the ZX81 kit means an even bigger saving. At £49.95 it costs almost 40% less than the ZX80 kit!

Lower price: higher capability
With the ZX81, it's just as simple to teach yourself computing, but the ZX81 packs even greater working capability than the ZX80.

It uses the same microprocessor, but incorporates a new, more powerful 8K BASIC ROM – the 'trained intelligence' of the computer. This chip works in decimals, handles logs and trig, allows you to plot graphs, and builds up animated displays.

And the ZX81 incorporates other operation refinements – the facility to load and save named programs on cassette, for example, or to select a program off a cassette through the keyboard.

Higher specification, lower price – how's it done?
Quite simply, by design. The ZX80 reduced the chips in a working computer from 40 or so, to 21. The ZX81 reduces the 21 to 4!

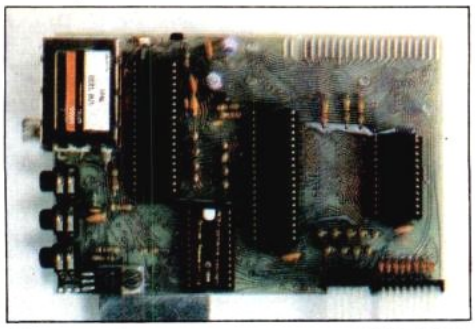
The secret lies in a totally new master chip. Designed by Sinclair and custom-built in Britain, this unique chip replaces 18 chips from the ZX80!

Built: £69.95 complete

Kit or built – it's up to you!

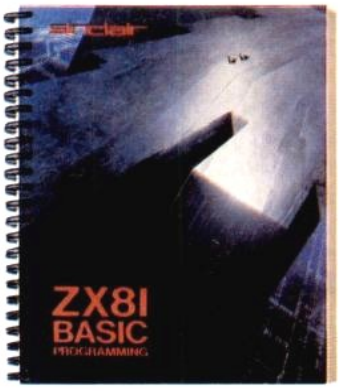
The picture shows dramatically how easy the ZX81 kit is to build: just four chips to assemble (plus, of course the other discrete components) – a few hours' work with a fine-tipped soldering iron. And you may already have a suitable mains adaptor – 600 mA at 9 V DC nominal unregulated (supplied with built version).

Kit and built versions come complete with all leads to connect to your TV (colour or black and white) and cassette recorder.

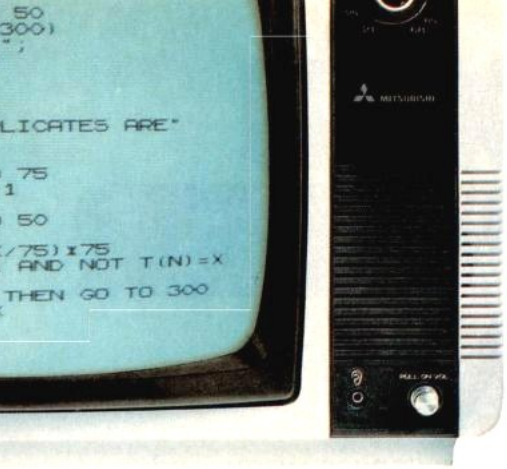


Proven micro-processor, new 8K BASIC ROM, RAM – and unique new master chip.

New BASIC manual



Every ZX81 comes with a comprehensive, specially-written manual – a complete course in BASIC programming, from first principles to complex programs.



New, improved specification

- Z80 A micro-processor – new faster version of the famous Z80 chip, widely recognised as the best ever made.
- Unique 'one-touch' key word entry: the ZX81 eliminates a great deal of tiresome typing. Key words (RUN, LIST, PRINT, etc.) have their own single-key entry.
- Unique syntax-check and report codes identify programming errors immediately.
- Full range of mathematical and scientific functions accurate to eight decimal places.
- Graph-drawing and animated-display facilities.
- Multi-dimensional string and numerical arrays.
- Up to 26 FOR/NEXT loops.
- Randomise function – useful for games as well as serious applications.
- Cassette LOAD and SAVE with named programs.
- 1K-byte RAM expandable to 16K bytes with Sinclair RAM pack.
- Able to drive the new Sinclair printer (not available yet – but coming soon!)
- Advanced 4-chip design: micro-processor, ROM, RAM, plus master chip – unique, custom-built chip replacing 18 ZX80 chips.

sinclair

ZX81

Sinclair Research Ltd,
6 Kings Parade, Cambridge, Cambs., CB2 1SN. Tel: 0276 66104.
Reg. no: 214 4630 00.

If you own a Sinclair ZX80...

The new 8K BASIC ROM used in the Sinclair ZX81 is available to ZX80 owners as a drop-in replacement chip. (Complete with new keyboard template and operating manual.)

With the exception of animated graphics, all the advanced features of the ZX81 are now available on your ZX80 – including the ability to drive the Sinclair ZX Printer.

Coming soon- the ZX Printer.

Designed exclusively for use with the ZX81 (and ZX80 with 8K BASIC ROM), the printer offers full alphanumerics across 32 columns, *and* highly sophisticated graphics. Special features include COPY, which prints out exactly what is on the whole TV screen without the need for further instructions. The ZX Printer will be available in Summer 1981, at around £50 – watch this space!

16K-BYTE RAM pack for massive add-on memory.

Designed as a complete module to fit your Sinclair ZX80 or ZX81, the RAM pack simply plugs into the existing expansion port at the rear of the computer to multiply your data/program storage by 16!

Use it for long and complex programs or as a personal database. Yet it costs as little as half the price of competitive additional memory.

How to order your ZX81

BY PHONE – Access or Barclaycard holders can call 01-200 0200 for personal attention 24 hours a day, every day. BY FREEPOST – use the no-stamp-needed coupon below. You can pay by cheque, postal order, Access or Barclaycard. EITHER WAY – please allow up to 28 days for delivery. And there's a 14-day money-back option, of course. We want you to be satisfied beyond doubt – and we have no doubt that you will be.

To: Sinclair Research Ltd, FREEPOST 7, Cambridge, CB2 1YY. **Order**

Qty	Item	Code	Item price £	Total £
	Sinclair ZX81 Personal Computer kit(s). Price includes ZX81 BASIC manual, excludes mains adaptor.	12	49.95	
	Ready-assembled Sinclair ZX81 Personal Computer(s). Price includes ZX81 BASIC manual and mains adaptor.	11	69.95	
	Mains Adaptor(s) (600 mA at 9 V DC nominal unregulated).	10	8.95	
	16K-BYTE RAM pack(s).	18	49.95	
	8K BASIC ROM to fit ZX80.	17	19.95	
	Post and Packing.			2.95

Please tick if you require a VAT receipt ☐ **TOTAL £** _____

*I enclose a cheque/postal order payable to Sinclair Research Ltd, for £ _____

*Please charge to my Access/Barclaycard account no. _____

*Please delete/complete as applicable. Please print.

Name: Mr/Mrs/Miss _____

Address _____

FREEPOST – no stamp needed. PCW04

ANY TIME NOW IT WILL BE WORTH BUYING A HOME COMPUTER.

You haven't seen a real home computer until you've seen the VIC 20 by Commodore.

But by August you'll get your chance.

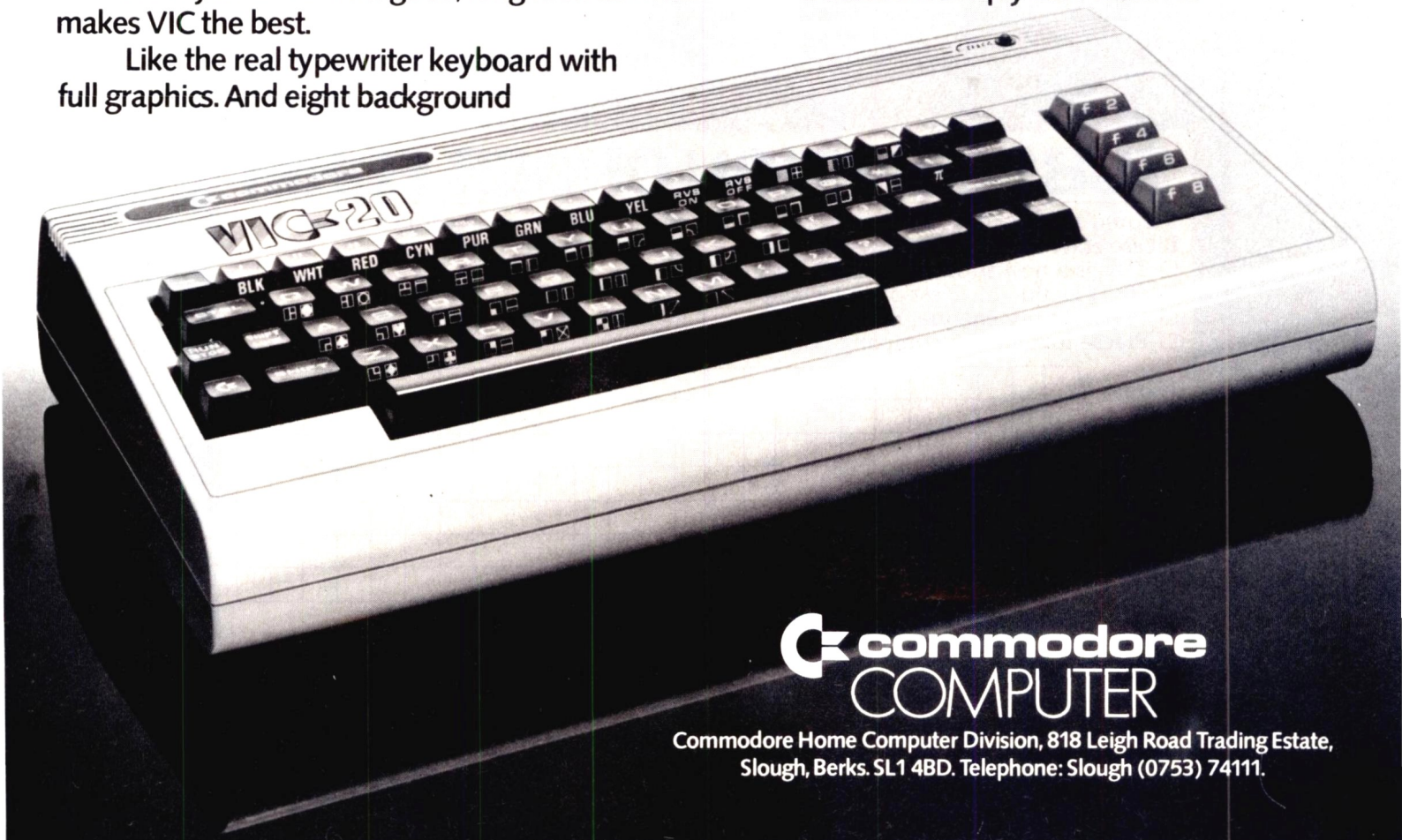
Because that's when the first VIC 20's will be arriving at your Commodore dealer.

Then you can take a good, long look at what makes VIC the best.

Like the real typewriter keyboard with full graphics. And eight background and 16 foreground colours. And music in three voices and three octaves, as well as language and sound effects.

So don't think of buying a home computer until then.

Because it simply isn't worth it.



commodore COMPUTER

Commodore Home Computer Division, 818 Leigh Road Trading Estate, Slough, Berks. SL1 4BD. Telephone: Slough (0753) 74111.

THE WAITING IS OVER.

THE RUSH HAS BEGUN.

For the past few months you've all been hearing and reading a lot of good things about Commodore's new VIC 20.

Like the fact that it has a real typewriter keyboard with full graphics.

And music in three voices and three octaves, as well as language and sound effects. And eight border and sixteen screen colours.

Not to mention that it's the best home computer in the world!

Well, after all that, what could you do but hang on?

But all that's over now. The VIC is at your dealer's.

So rush down and see the VIC. And you'll see why it was well worth the wait.

commodore COMPUTER

For more information on the VIC 20, telephone or write to Commodore Information Centre, Baker Street, High Wycombe, Bucks. Tel: High Wycombe 445211.

NOW YOU CAN BUY THE BEST HOME COMPUTER IN THE WORLD.

Commodore's brilliant new VIC20 home computer is at your dealer's today. Now you can get your hands on the world's best home computer, we're sure you won't be disappointed.

Here's a brief reminder of VIC's many features:

A typewriter keyboard with graphics.

5K Memory–expandable to 29.5K user RAM.

8 programmable function keys.

High resolution graphics.

Music in three voices and three octaves, as well as sound effects.

Eight border colours and sixteen screen colours.

All in a superbly-designed, compact unit with built-in facilities for expansion.

Now you can take a look for yourself. And even take VIC home tonight.

commodore COMPUTER

For more information on the VIC 20, telephone or write to: Commodore Information Centre, Baker Street, High Wycombe, Bucks, or Tel: Slough 79292.

The TI-99/4A The Home Computer worthy of the name.

Even if you're new to computers, you'll be using the TI-99/4A within minutes of plugging it into any standard TV set. Because the TI-99/4A is a true computer for the home. Immediately accessible to the whole family. All for around £299.

Just snap in one of our wide selection of Solid State Software* Command Modules, touch a few keys, and you're ready to go. The 40 modules can sharpen your children's maths, teach you to win at chess or even help you with household financial decisions. And much more besides. In all, over 400 programs are available.

All enhanced by full music capability and 16-colour graphics.

Another development which sets the TI-99/4A apart from the rest, is our optional Solid State Speech* Synthesiser. Actually reproducing the human voice. With our new Emulator Command Module,* its vocabulary is unlimited.

For data input/output you can use an ordinary audio cassette recorder. And a full-size professional keyboard makes it easy to use.

The TI-99/4A comes with TI BASIC built in. Ideal for when you want to learn programming – and to get you started there's our "Beginner's Basic" course, free with each machine – yet powerful enough for even the most experienced programmer.

To help you get the most from the TI-99/4A you can join the independent users' club. And there's a special magazine ("99'er") available through dealers, or on subscription.

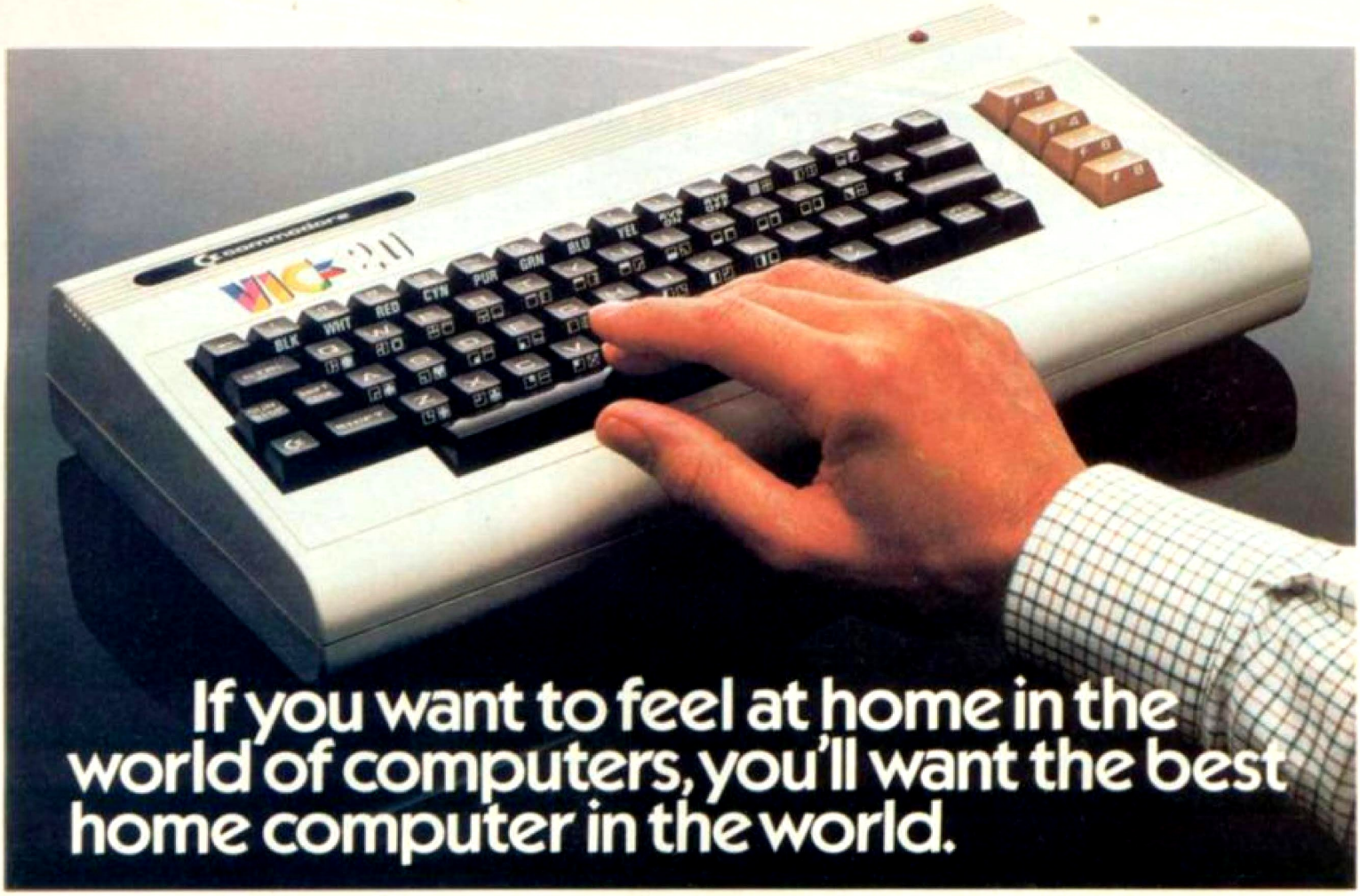
So, if you're looking for a home computer, you can't afford to miss the TI-99/4A for versatility, power and value for money.

* 16K RAM. Expandable to 48K.
* 26K ROM including 14K BASIC.
* Command Modules add up to 36K ROM.
* 13-digit floating point.
* Other languages soon – LOGO, UCSD PASCAL, TMS 9900 Assembler.
* Options – Speech Synthesiser, Thermal Printer, RS-232 Peripheral Adaptor, Disk Memory System.

To find your local dealer check the list on the left, or for more information write to Texas Instruments Ltd., (MS.24), Manton Lane, Bedford MK41 7PA.

TEXAS INSTRUMENTS LIMITED

*Trademarks of Texas Instruments.



If you want to feel at home in the world of computers, you'll want the best home computer in the world.

We live in the age of computers.

Coming to terms with them and enjoying them is part of coming to terms with the twentieth century.

A few years ago, a computer would have filled a fair-sized room. Now microtechnology has allowed Commodore to produce a home computer, the VIC 20, that's no bigger than a typewriter yet performs miracles.

FOR BUSINESS. OR PLEASURE.

VIC can keep your diary up to date. Teach you mathematics. Play an enormous range of video games. Even play a piece of music to soothe your worried brow.

In fact, you and VIC can do almost anything better. Keeping records of family finances, sorting out and working out household accounts, being one step ahead of the bank manager or helping your own business be more businesslike.

VIC's THE BEST. BY FAR.

Contrary to popular belief, computers are really rather friendly. VIC is particularly easy to understand. It's what the computer people call 'user friendly.' The typewriter-type keyboard is easy to use. It even tells you about mistakes you might make.

If you're technically minded, here's a reminder. VIC has a 5k memory expandable to 29k. (That means you can put in an almost endless amount of information.)

But what makes the VIC the best home computer by far are features that are just not available in most other home computers. Features like colour, computer graphics and sound.

PLUG IN AND YOU'RE OFF.

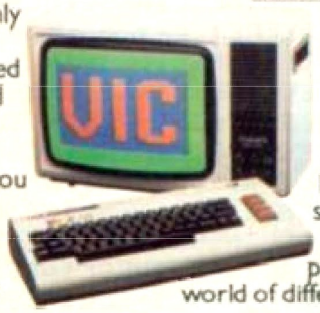
VIC plugs in to any television set, colour or black and white. (We even fit a 13 amp plug, so you can play with VIC right away.) You don't have to learn a special language. VIC speaks English, just like you. With the help of our handbook, you will begin to feel at home to the world of computers in no time at all.

COMPUTER SUPERMARKET'S GUARANTEE.

Buy through Computer Supermarket and you get exactly what's promised. We guarantee you that.

Every machine is thoroughly tested before it's despatched. And every machine is guaranteed for twelve months on parts and labour. (Not that you'll need it, of course.)

In the unlikely event that you don't want to keep your VIC, just return it, in its original packaging, within 30 days and your money will be completely refunded.



FREE PROGRAMS.

Apart from the more practical things like accounting, and the more pleasurable things like video games, you can put VIC to literally hundreds of uses.

There are pre-recorded programs on many different subjects. You can develop your own programs and store them by using ordinary cassette tape.

The special Commodore cassette deck is on offer at only £44.95. If you buy VIC and the deck together we'll send you a 6 program pack to start you off that's absolutely free.

YOUR FUTURE WITH VIC.

It's a big step into the future. Understanding the future. Having fun in the future. Even saving money in the future. Every member of the family, especially the young, will feel at home with VIC right away. So send in the coupon. We're sure you'll find the best home computer in the world will make the world of difference to you and your family.

Computer Supermarket Ltd., Unit 8, Southfolds Road, Oakley Hay Industrial Estate, Corby, Northants. Tel: (0536) 744015. Reg. No. 2646589. Prestel No. 400400.

Computer Supermarket Ltd., Unit 8, Southfolds Road, Oakley Hay Industrial Estate, Corby, Northants.
Please accept my order for _____ VIC 20's at £189.95 each inclusive of packing, carriage and insurance.
Please send me _____ Cassette Decks at £44.95 incl. Free 6 program cassette if VIC 20 and Cassette Deck ordered together.
*Please debit my Access/Barclaycard/American Express/Diners Card. Account no. _____
_____ £ _____ I enclose Cheque/P.O. _____
Please allow twenty-one days for delivery. *Credit Card orders can be telephoned to (0536) 744015 anytime.

Name: Mr/Mrs/Miss _____

Address: _____

Signature _____

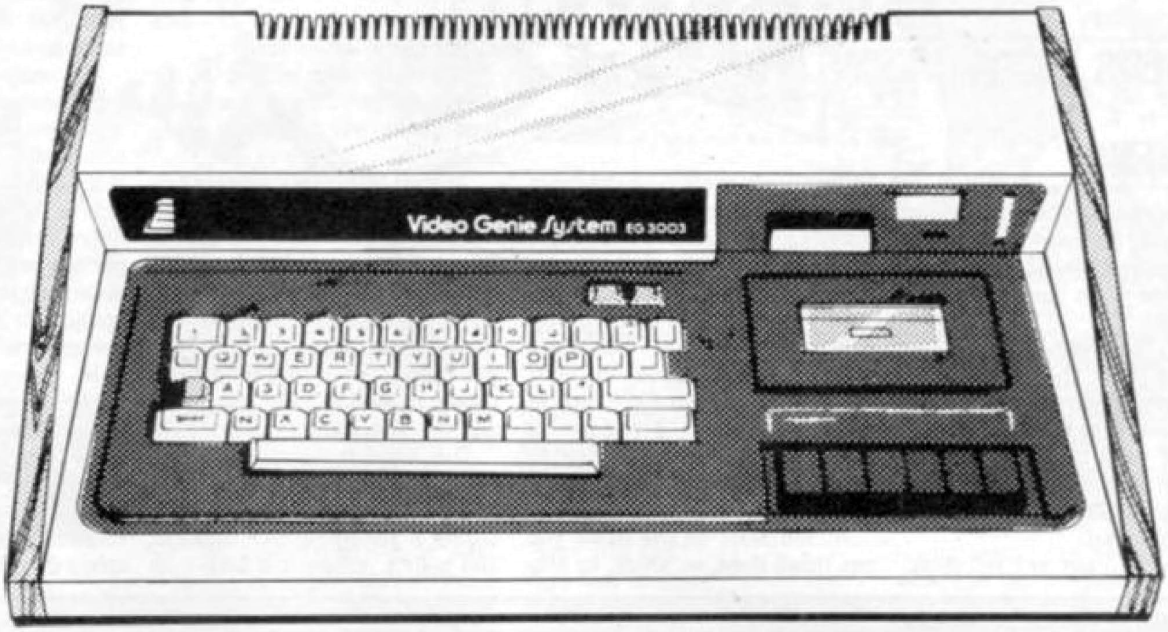
COMPUTER SUPERMARKET

A Commodore Appointed VIC Dealer. Please make remittances payable to Computer Supermarket Readers Account.

CVG 1

Circle No. 122

Video Genie...



Are you a home enthusiast taking your first tentative steps into the enthralling world of micro-computers? If so, the Video Genie is the ideal complete system for you!

It's a real micro-computer, not a pocket one, yet it only needs connecting to a domestic T.V. set to produce superb results.

The Genie is compatible with the popular TRS 80 16K level 2, the best selling computer of all time. As well as its lower price, the Genie offers an in built cassette deck, 16K RAM, 12K ROM with BASIC interpreter, full size keyboard and a stylish carrying case. So it is not only excellent value for money, but an ideal "First computer" on which to learn programming.

There are literally 1000's of pre-recorded programs available, including educational, leisure and small-business applications, and simple BASIC language means you can write your own programs with ease.

Extended BASIC.

The Microsoft extended BASIC has many powerful features, including double precision variables, scientific functions, formatted printing, extended editing sub-commands, automatic line numbering, multiple dimensional arrays, complete string manipulation, direct access to graphics and machine language sub-routines.

Memory.

The Genie EG 3003 model has 16K of internal RAM expandable externally to 48K using the special Expansion unit. 12K of ROM contains the Microsoft BASIC.

Cassette.

Two cassette interfaces are provided for both the internal and an external cassette unit.

CPU.

The machine uses the industry Standard Z80 micro-processor.

Display.

64 or 32 characters × 16 lines are available on the full display.

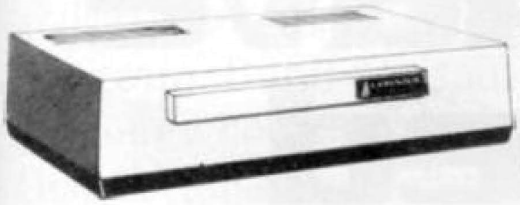
TOWE electronics

one giant step for micro-computer systems

12" Monitor.

The additional purchase of the EG 100 Monitor offers 3 distinct advantages

- It gives a considerably better quality display.
- It does not interfere with domestic T.V. viewing.
- It comes in an attractive matching style.

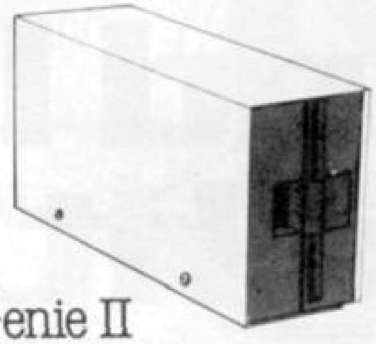


Expander.

The expansion box unleashes the full possibilities of the Genie. It contains a selection of interfaces, allowing the connection of up to 48K RAM, 4 disk drives, printers and S100 cards.

Disk Drive.

As well as the obvious advantage of mass-storage, the addition of the disk system to the Genie means much faster access to other languages and full random access file handling. Up to 4 drives can be used on a system.



. . . and introducing Genie II

. . . one giant leap for micro, business systems!

New and exclusive! The Genie II is a breakthrough for small business computers. Harnessing all the advantages of the Genie, including low price, Genie II adapts perfectly to commercial functions with the following features.

- Numeric keyboard
- Four usable, definable function keys.
- Extension to BASIC
- Basic business commands
- Fully expandable for same peripherals.

For full details and demonstrations of the Video Genie system or Genie II contact your local dealer, or write directly to the sole importers at the address below.

Video Genie Approved Dealers

AVON Microstyle, Bath, 0225 334659/319705. **BEDFORD** Computopia, Leighton Buzzard, 0525 376600. Comserve, Bedford, 0234 216749. Cavern Electronics, Milton Keynes, 0908 314925. **BERKSHIRE** P.C.P Reading, 0734 589249. **BUCKS** Interface Components Ltd, Amersham, 02403 22307. Photo Acoustics, Newport Pagnell, 0908 610625. **CAMBS** Cambridge Micro Computers, Cambridge, 0223 314666. **CHESHIRE** Hewart Electronics, Macclesfield, 0625 22030. **CUMBRIA** Kendal Computer Centre, Kendal, 0539 22559. **DERBYS** Kays Electronics, Chesterfield, 0246 31896. T. Crossley, Chesterfield, 0246 850357. Lowe Electronics, Matlock, 0629 4995. **DORSET** Blandford Computers, Blandford Forum, 0258 53737. **ESSEX** Emprise, Colchester, 0206 865926. Compuskill, Romford, 0708 751906. Infolab, Chelmsford, 0245 35710. CSSC, Ilford, 01-554 3344. **GLOS** MPL Computers, Cheltenham, 0242 582090. Petrie Systems, Cheltenham, 0242 584060. **HERTS** Photo Acoustics, Watford, 0923 46698. Watford Electronics, Watford, 0923 40588/37774. Q Tek Systems, Stevenage, 0438 65385. Comp Shop, New Barnet, 01 4412922. ***KENT*** Matrix Computer Systems, Beckenham, 01 658 7508/7551. Business Systems, Hempstead, 0635 362652. Thanet Electronics, Herne Bay, 02273 63859. The Computer Room, Tunbridge Wells, 0892 41645. SMG Microcomputers, Gravesend, 0474 55813. **LANCS** Computer Business Systems, Lytham St. Annes, 0253 730033. Microdigital, Liverpool, 051 227 2535. Mighty Micro, Burnley, 0282 32209/53629. Leisaronics, Blackpool, 0253 27091. Harden Microsystems, Blackpool, 0253 27590. ABC Supplies, Levenshulme, 061 431 9265. HR Control Systems, Chorley, 02572 75234/5. Computercat, Leigh, 0942 601818. Micro Chip Shop, Fleetwood, 03917 79480. Micro Chip Shop, Preston, 0722 22869 79511. Micro Chip Shop, Blackpool, 0253 403 122. Sound Service, Burnley, 0282 38481. **LEICS** Eley Electronics, Leicester, 0533 872522. Arden Data Processing, Leicester, 0533 22255. Kram Electronics, Anstey, 053721 3575. **LONDON (CENTRAL)** City Microsystems Ltd, London, 01 588 7272. Sumlock Bondain, EC1, London, 01 250 0505. **LONDON (NORTH)** Henry's Radio, London, 01 402 6822. Radio Shack, NW6, London, 01 624 7174. Comp Shop, 311 Edgware Rd, London, 01 262 0387. Chromasonic Electronics, N19, London, 01 833 3705. Davinci Computers, Edgware, London, 01 952 0526. Comp Shop, New Barnet, London, 01 441 2922. NIC, Tottenham, London, 01 808 0377. **LONDON (WEST)** Ecobits, Shepperton, 09322 20826. **NORTH EAST** H.C.C.S. Associates, Gateshead, 0632 821924. 3-Line Computing, Hull, 0482 859169. Derwent Radio, Scarborough, 0723 65996. Briers Computer Services, Middlesbrough, 0642 242017. General Northern Microcomputers, Hartlepool, 0783 863871. **NORTHANTS** Arden Data Processing, Peterborough, 0733 49577. **NOTTS** Electronic Servicing Co, Lenton, 0602 783938. University Radio Stores, Nottingham, 0602 45466. Midland Microcomputers, Nottingham, 0602 298281. East Midland Comp. Services, Arnold, 0602 267079. Mansfield Computer & Electronics, Mansfield, 0623 31202. **NORFOLK** Anglia Computer Centre, Norwich, 0603 29652. **OXFORD** Micro Business Systems, Witney, 0993 73245. Magnus Microcomputers, Kidlington, 08678 6703. **SALOP** Tarrant Electronics, Newport, 0952 812134. **SCOTLAND** Computer and Chips, St. Andrews, 0334 72569. Scotbyte Computers, Edinburgh, 031 343 1005. Esco Computing, Glasgow, 041 204 1811. Silicon Centre, Edinburgh, 031 332 6277. **SOUTH** Catronics, Wallington, 01 669 6700/1. Gemsoft, Woking, 04862 22881. Castle Electronics, Hastings, 0424 437875. Gamer, Brighton, 0273 698424. **SOUTH WEST** Diskwise Ltd, Callington, 05793 3780. Electrosure, Exeter, 0392 56280 56687. West Devon Electronics, Yelverton, 082 285 3434. **SUFFOLK** Rebvale Computers, Bury St. Edmunds, 095 381 316. Marathon Electronics, Ipswich, 0473 75476. Microtek, Ipswich, 0473 50152. **SURREY** Croydon Computer Centre, Thornton Heath, 689 1280. **SUSSEX** Nestra Electronics, Chichester, 0243 512861. **WALES** MRS Communications, Cardiff, 0222 616936/7. Morriston Computer Centre, Swansea, 0792 795817. Tryfan Computers, Bangor, 0248 52042. **WEST MIDLANDS** Ward Electronics, Birmingham, 021 554 0708. Allen TV Services, Stoke on Trent, 0782 616929. Microprint, Stoke on Trent, 0782 48346. **YORKS** Advance TV Services, Shipley, 0274 585333. Amateur Radio Shop, Huddersfield, 0484 20774. Thomas Wright, Bradford, 0274 663471. Photo Electrics, Sheffield, 0742 53865. Allan M. Plainer Ltd, Leeds, 0532 688397. Quadraphenia, Sheffield, 0742 77824. Scene and Heard, Halifax, 0422 59116. Spot Computer Systems, Doncaster, 0302 25159. **EIRE** Compshop, Dublin, 74933. D.B. Microcomputers, Limerick, 061 42733. **NORTHERN IRELAND** Business Electronic Equipment, Belfast, 0232 46161. Brittain Laboratories Ltd., Belfast, 0232 28374. **JERSEY** G.B. Organs, St. Saviour, 0534 26788/23564.

Chesterfield Road, Matlock, Derbyshire DE4 5LE
Telephone: 0629 4995. Telex: 377482 Lowlec G.

Circle No. 143

1982

"Give me one good reason why I should choose a VIC 20 home computer."

1. VIC is outstanding value for money. No other colour home computer can give so much for under £200.

2. Total standard memory 25K made up of 20K ROM and 5K RAM.

3. Fully expandable to 32K of user RAM.

4. Microsoft Basic interpreter as standard.

5. Accessible machine language as standard.

6. Connects direct to monitor or standard television.

7. Full size typewriter-style keyboard.

8. Full colour and sound.

9. All colours directly controllable from the keyboard.

10. 62 predefined graphic characters direct from the keyboard.

11. Full set of upper and lower case characters.

12. 512 displayable characters direct from the keyboard.

13. High resolution graphics capability built into the machine.

14. Programmable function keys.

15. Automatic repeat on cursor function keys.

16. User-definable input/output port.

17. Machine bus port for memory expansion and ROM software.

18. Standard interfaces for hardware peripherals.

19. VIC 20 is truly expandable into a highly sophisticated computer system. The comprehensive list of accessories includes the following:

- Cassette tape unit.
- Single drive 5¼" floppy disk unit (170 K bytes capacity).
- 80-column dot matrix printer.
- 3K, 8K and 16K RAM expansion cartridges.
- Programming aid packs, including a high resolution graphics cartridge, a machine code monitor cartridge and a programmers' aid cartridge.
- Memory expansion board.
- Plug-in conversion box for a full 32K, 40-column x 25 lines VIC including Prestel compatability.
- Prestel/Tantel interface package.
- RS 232C communication cartridge.
- IEEE/488 interface cartridge.
- Joysticks, light pens, paddles and motor controllers.

20. Full range of software for home, education, business and entertainment on disk, cassette and cartridge.

21. Books, manuals and learning aids from Teach Yourself Basic to the VIC programmers' reference guide (a must for advanced programmers).

22. Full support for VIC owners – their own magazine 'VIC Computing' as well as a national network of VIC user groups.

23. National dealer network providing full service and support to VIC owners.

24. Expertise and experience – Commodore are world leaders in microcomputer and silicon chip technology.

25. Commodore is the leading supplier of micro-computers in the UK to business, schools industry and the home.

26. VIC 20 is the best-selling colour home computer in the UK.

How many reasons was it you wanted?

commodore

VIC 20

The best home compute in the world.

FOR MORE INFORMATION ON THE VIC 20, TELEPHONE OR WRITE TO: COMMODORE INFORMATION CENTRE, BAKER STREET, HIGH WYCOMBE, BUCKS. TEL: SLOUGH 79292.

Don't let its size fool you.

If anything NewBrain is like the Tardis.

It may look small on the outside, but inside there's an awful lot going on.

It's got the kind of features you'd expect from one of the really big business micros, but at a price of under £200 excluding VAT it won't give you any sleepless nights.

However, let the facts speak for themselves.

You get what you don't pay for.

NewBrain comes with 24K ROM and 32K RAM, most competitors expect you to make do with 16K RAM.

What's more you can expand all the way up to 2 Mbytes, a figure that wouldn't look out of place on a machine costing ten times as much.

We've also given you the choice of 256, 320, 512 and 640 x 250 screen resolution, whereas most only offer a maximum of 256 x 192.

Big enough for your business.

Although NewBrain is as easy as ABC to use (and child's-play to learn to use) this doesn't mean it's a toy.

Far from it.

It comes with ENHANCED ANSI BASIC, which should give you plenty to get your teeth into.

And it'll also take CP/M® so it speaks the same language as all the big business micros, and feels perfectly at home with their software.

NO OTHER MICRO HAS THIS MUCH POWER IN THIS MUCH SIZE FOR THIS MUCH MONEY.

So as a business machine it really comes into its own.

The video allows 40 or 80 characters per line with 25 or 30 lines per page, giving a very professional 2000 or 2400 characters display in all on TV and/or monitor. And the keyboard is full-sized so even if you're all fingers and thumbs you'll still be able to get to grips with NewBrain's excellent editing capabilities.

When it comes to business graphics, things couldn't be easier. With software capabilities that can handle graphs, charts and computer drawings you'll soon be up to things that used to be strictly for the big league.

Answers a growing need.

Although NewBrain, with its optional onboard display, is a truly portable micro, that doesn't stop it becoming the basis of a very powerful system.

The Store Expansion Modules come in packages containing 64K, 128K, 256K or 512K of RAM. So, hook up four of the 512K modules to your machine and you've got 2 Mbytes to play with. Another feature that'll come as a surprise are the two onboard V24 interfaces.

With the aid of the multiple V24 module this allows you to run up to 32 machines at once, all on the same peripherals, saving you a fortune on extras.

The range of peripherals on offer include dot matrix and daisy wheel printers, 9," 12" and 24" monitors plus 5¼" floppy disk drives (100 Kbytes and 1 Mbyte) and 5¼" Winchester drive (6-18 Mbytes).

As we said, this isn't a toy.

It doesn't stop here.

Here are a couple of extras that deserve a special mention.

The first, the Battery Module, means you won't be tied to a 13 amp socket. And, even more importantly, it means you don't have to worry about mains fluctuations wreaking havoc with your programs.

The ROM buffer module gives you a freedom of another sort.

Freedom to expand in a big way. It gives you additional ROM slots, for system software upgrades such as the Z80 Assembler and COMAL, 2 additional V24 ports, analogue ports and parallel ports.

From now on the sky's the limit.

Software that's hard to beat.

A lot of features you'd expect to find on software are actually built into NewBrain so you don't need to worry about screen editing, maths, BASIC and graphics.

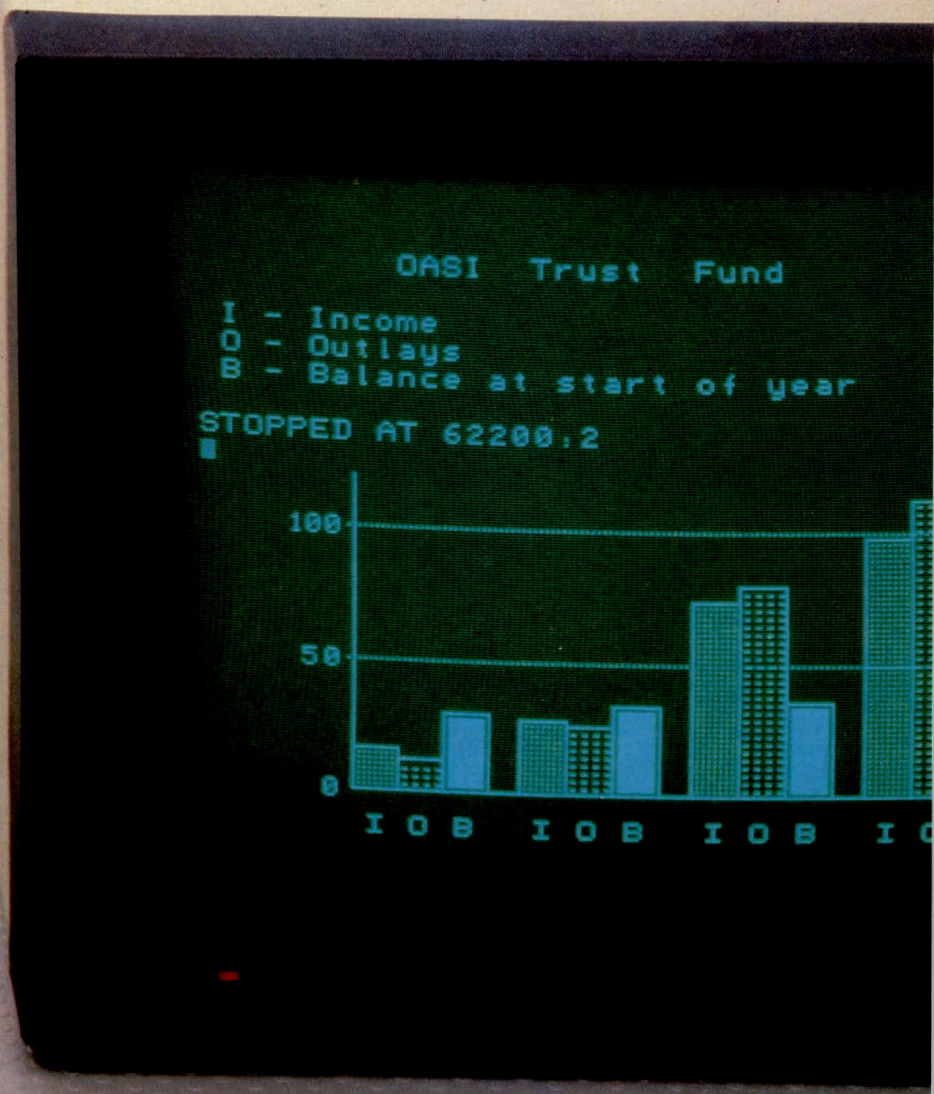
However, if you're feeling practical you can always tackle household management, statistics and educational packages. And because NewBrain isn't all work and no play, there's the usual range of mind-bending games to while away spare time.

Waste no more time.

To get hold of NewBrain you need go no further than the coupon at the bottom of the page.

With your order we'll include a hefty instruction manual so you'll know where to start, and a list of peripherals, expansion modules, and software so you'll know where to go next.

® CP/M is the registered trade mark of Digital Research Inc.



NewBrain, Grundy Business Systems Ltd., Grundy House, Somerset Road, Teddington TW11 8TD.

Each NewBrain order will include a FREE comprehensive user manual, a catalogue of expansion modules and peripherals, and a detailed list of available software.

Please send me the following:–

Quantity	Item	Price per item (Inc. VAT & p&p)	Total
	NewBrain A	£233.00	
	NewBrain AD with onboard single line display	£267.50	
	Printer	£466.00	
	Monitor 12"	£142.50	
		Total £	

I enclose a cheque/Postal Order for £_____ payable to Grundy Business Systems Reader Account. NewBrain, Grundy Business Systems Ltd., Grundy House, Somerset Road, Teddington TW11 8TD.

Please debit my Access Card No:_____ my Barclaycard No:_____

Signature_____

Name_____

Address_____

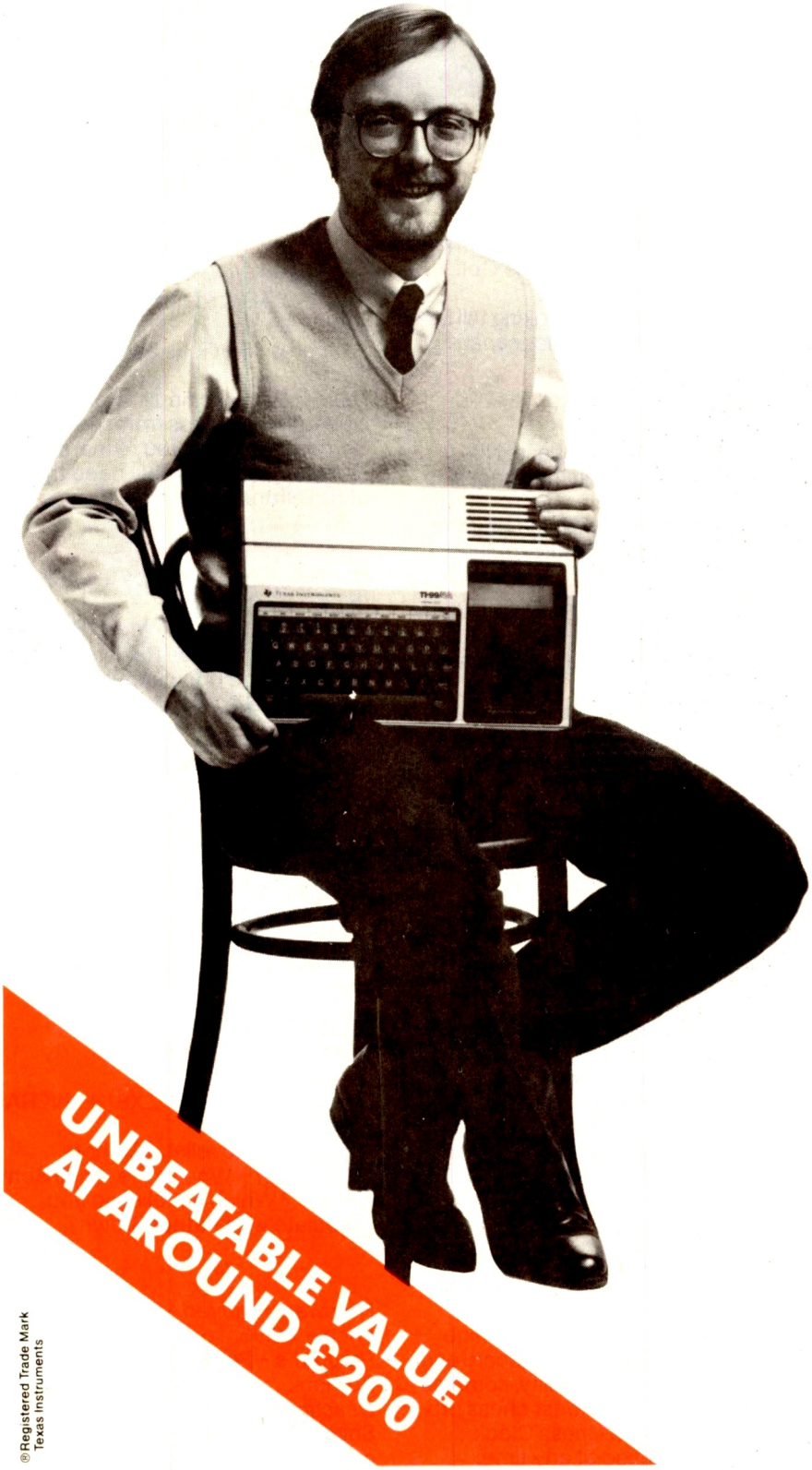
_____

_____ Postcode_____

Registered Number 1522978
VAT Number 358661618
Please allow up to 28 days for delivery.

NEWBRAIN

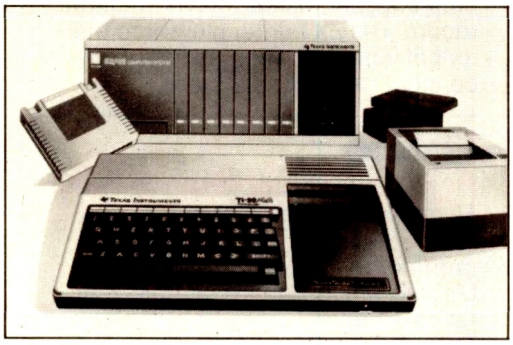
You can't get a Home Computer from Texas Instruments under 16 K RAM.



Make the right move into computing with the Home Computer from Texas Instruments. It gives you a large combined RAM/ROM capacity up to 110 K Byte and the ability to expand with a full range of peripherals and software. So as your knowledge of computers increases the TI Home Computer will grow with you.

Just compare the versatility of the TI Home Computer with its price – you'll find it real value for money that will prove to be a good long term investment.

The TI-99/4A is a sophisticated computer designed not only for the beginner with its ease of operation, but also for the professional with its vast computing power through a 16 bit microprocessor. And it simply plugs into an ordinary household TV set.



With its high resolution graphics with 32 characters over 24 lines in 16 colours (256 x 192 dots), 3 tones in five octaves plus noise, and BASIC as standard equipment and options such as other programming languages – UCSD-PASCAL, TI-LOGO and ASSEMBLER – and speech synthesis, you'll find that the TI 99/4A more than compares with the competition. Especially when the starting price is around £200. When you want to solve problems there are over 600 software programs available worldwide – including more than 40 on easy-to-use Solid State Software® Modules.

After all, from the inventors of the microprocessor, integrated circuit and microcomputer, it's only natural to expect high technology at a realistic price.

We'll help you do better.

TEXAS INSTRUMENTS
LIMITED

®Registered Trade Mark
Texas Instruments

A bigger range than the Himalayas

The Acorn Atom From £118 plus VAT.

Personal Computing – Instructional and Fun

To get the best out of personal computing you need two things – hardware that is powerful and reliable – software that uses the hardware to the full. The Atom range is just that.

The Atom – tried and tested

The Atom was designed to last – inside and out. Outside a rugged, high impact case with a proper keyboard. Tested to withstand children as well as adults. Inside a powerful operating system that will never be bettered. It is available in several versions so you can choose what you want. And there is an enormous range of additional boards that fit inside the casing – start where you like – add more power, more versatility when you need it.

The Accessories – something for everyone

Diskpacks, printers, monitors, plug-in ROM's, manuals, other languages, arcade-type games, business and household software. Whatever you want to do – teach your children, run your business – you can't do better than choose the Atom range.

Available Nationwide

Not just mail order, the Atom range can be bought through a national dealer network – they will help and advise you. And in the unlikely event of breakdown they will be there. Like our equipment Acorn Computers are here to last.

ACORN COMPUTER

Acorn Computers Limited, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN Tel: (0223) 245200.

FREE Catalogue

For full details of the complete range and a list of dealers just fill in the coupon or write to us.

To: Acorn Computers Ltd, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN Tel: (0223) 245200.

Please rush me a complete list of the Atom range.

Name: _____

Address: _____

_____

_____

_____

Postcode: _____

Read this ad

You: "Darling, I've decided to buy a computer."

Her: "**++**??!!***@XX??££**??!!? off!"

You: "Yes, I know we could do with a new washing machine. But the new Dragon 32 Computer is much more important. It's the first computer actually designed for all the family - and it costs under £200!"

Her: "**++??!!@££??! fortune!"

You: "No, I'm not being selfish. Computers are for the whole family - and they're going to play a big part in the children's future."

Her: "Oh?"

From this point on, the conversation should follow more reasonable lines. Allowing you to fully explain the many advantages of the new Dragon 32 family computer.

32K RAM FOR UNDER £200.*

For a start, the Dragon offers 32K RAM. Your wife may not understand that, so just tell her that the Dragon's capabilities are truly massive - at least twice as powerful as its competitors, with some features you won't find even in more expensive units. The Dragon will give you all the power you're likely to need, and more, to create your own programs - along with an exciting range of software which can do anything from helping with kids' spelling and arithmetic to creating your own cartoons.

THE FIRST FAMILY COMPUTER.

All of which brings you nicely to the point where you tell your wife just how much fun the kids will have with the Dragon. How it will save her all that

*Television not included in price.

money on those Space Invader machines. How it will magically translate simple typed instructions into beautiful drawings and designs using set, line, circle, draw, scale, rotate and paint features, in up to 9 colours - and play and compose

to your wife.

SPECIFICATIONS
6809E MICROPROCESSOR. Pet, Apple, Atari 400, BBC Micro, and VIC 20 still have the less powerful 6502.
32K RAM (as standard). At least twice the power of similarly priced machines. Expandable to 64K RAM.
EXTENDED MICROSOFT COLOUR BASIC (as standard). Featuring: ADVANCED GRAPHICS (set, line, circle, paint, print, draw, rotate and print using). ADVANCED SOUND 5 octaves, 255 tones. AUTOMATIC CASSETTE RECORDER CONTROL. FULL EDITING with INSERT and DELETE.
9 COLOUR, 5 RESOLUTION DISPLAY.
USE WITH ANY U.H.F. TV and/or separate P.A.L. monitor.
PROFESSIONAL QUALITY KEYBOARD. Typewriter feel. Guaranteed for 20 million depressions.
PRINTER (Centronics parallel).
JOYSTICK CONTROL PORTS.

with 5 octaves of music. How it will engross your children in mind-boggling adventures in dungeons and caves without even getting their knees dirty. And the Dragon works with any U.H.F. TV.

THEY'LL LEARN AS THEY PLAY.

And then you can casually point out that although the kids are having fun, they're also learning. And within a very short space of time, the whole family will be completely at home with programming - with computer language - with every aspect of how computers work. Which can't do their future prospects any harm at all.

BRILLIANTLY SIMPLE INSTRUCTION MANUAL.

The Dragon is made in Britain, designed with the help of British Universities. And it's also worth remembering that the Dragon's instruction manual is clearer and easier to understand than any other home computers.

That its top-quality keyboard is as easy to use as a typewriter, and so well made it's guaranteed for twenty million depressions.

TAKE THE FAMILY DOWN THE HIGH STREET.

And if she still wants to know more, take her to see the Dragon 32. It'll soon be available in most good stores - or you can send the coupon for further details.

And if you're one of our many lady readers, please accept our apologies.

Perhaps you'd like to read this ad to your husband.

DRAGON 32

The first family computer.

To: Jean Webster, Dragon Data Ltd., Queensway, Swansea Industrial Estate, Swansea, Glamorgan SA5 4EH.
Tel: 0792 580651.

Please send me further information about the Dragon 32.

Name _____

Address _____

_____

_____ PCW

SEE US AT THE PERSONAL COMPUTER WORLD SHOW, HALL A (LOWER) STAND 122.

A member of the Mettoy Group of Companies.

The new Dragon 32. So well designed, you'll even understand this ad.

If you're already a computer expert, may we refer you to the box of technical specifications displayed opposite.

If you're not, may we refer you to the new Dragon 32 Family Computer. A computer so easy to understand, you won't understand why all the others seem so difficult.

And the new Dragon 32 costs under £200.

32K RAM FOR UNDER £200?*

When you're comparing computers, the first thing you need to know is the size of the memory. In plain English, the Dragon has approximately 32 thousand units of Random Access Memory. (32K RAM for those who prefer to be blinded by science.) This means that the Dragon's memory is at least twice as powerful as its competitors.

With a memory this powerful, the amount of information the Dragon can store is literally vast. But the Dragon doesn't just make it easy to store information. It makes it easy to use, too.

USER-FRIENDLY?

You may have heard of the term 'user-friendly.' Reverting to plain English once more, this means simply that the computer will go out of its way to understand you, rather than vice-versa.

The Dragon 32 is so user-friendly, it practically licks your hand.

You tap (literally) its vast resources through a beautifully-designed keyboard that's as easy to use as a typewriter.

On this keyboard, you type in a language which is surprisingly close to the English you talk every day. The Dragon 32 will receive your order. Understand it. Send it to the appropriate section of its massive brain. And then display the appropriate information on your screen. All before you can say 'gobbledygook.'

*TV not included in price.

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6809E MICROPROCESSOR. Pet, Apple, Atari 400, BBC Micro, and VIC 20 still have the less powerful 6502.
32K RAM (as standard). At least twice the power of similarly priced machines. Expandable to 64K RAM.
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9 COLOUR, 5 RESOLUTION DISPLAY.
USE WITH ANY U.H.F. TV and/or separate P.A.L. monitor.
PROFESSIONAL QUALITY KEYBOARD. Typewriter feel. Guaranteed for 20 million depressions.
PRINTER (Centronics parallel).
JOYSTICK CONTROL PORTS.

FIRE YOUR IMAGINATION.

Learning how to use the Dragon 32 won't cause you to experience any problems. Learning what you can use it for will cause you to experience something entirely different.

Delight. Surprise. Fascination. And challenge.

The Dragon offers a range of some of the most popular computer games in the world. From those celebrated space battles to mind-boggling adventures in seemingly unfathomable dungeons and caves.

As if by magic, a simple typed message will command the Dragon to create your own drawings. Then it will colour and paint them in 9 colours.

And it's clever enough to create virtually any image you want - circles and arcs as well as straight lines.

The Dragon will also play and compose music with you, with a range of 5 octaves. And it works with any UHF TV or PAL monitor.

LEARNING THROUGH PLAYING.

All of this makes the Dragon the ideal machine to build your children's interest in the world of computers as they become increasingly more vital. School-children already enjoy using computers.

The Dragon is the first computer specifically for the family - so by enjoying yourselves at home, you and your children can soon become expert enough to create your own programs.

PRODUCT / FEATURE	DRAGON 32	SINCLAIR SPECTRUM	ACORN ATOM	VIC 20	TI 99/4A	BBC MICRO 'A'
PRICE	£199	£125	£175	£190	£199	£300
STANDARD RAM SIZE	32K	16K	8K	5K	16K	16K
STANDARD AVAILABLE RAM FOR HIGH RESOLUTION GRAPHICS	26K	9K	N/A	N/A	14K	3K
EXTENDED MICROSOFT BASIC AS STANDARD	YES	NO	NO	NO	NO	NO
PROFESSIONAL-TYPE KEYBOARD	YES	NO	YES	YES	YES	YES

BRILLIANTLY SIMPLE GUIDE.

The Dragon is living proof that you don't have to be an expert in computerspeak to be an expert in computers. It comes with the easiest-to-understand instruction manual ever written for a home computer.

Every step, every explanation, is made clear - even if you're a beginner. In minutes, it will show you how to write a simple program. Within hours, you'll be fascinated. And from then on, you'll continue to be astounded by the new world which the Dragon's power and versatility will open up to you.

See the new Dragon 32 in your High Street. At under £200, it's not just the first family computer. It also has all the features an expert could wish for.

Except perhaps the jargon.

DRAGON 32

The first family computer.

To: Jean Webster, Dragon Data Ltd, Queensway, Swansea Industrial Estate, Swansea, Glamorgan SA5 4EH.
Tel: 0792 580651.

Please send me further information about the Dragon 32.

Name _____

Address _____

_____

_____ PCW

A member of the Mettoy Group of Companies.

"...the quality of the colour display is excellent". Popular Computing Weekly.
"The graphics facilities are great fun". Personal Computer World.
"...the Spectrum is way ahead of its competitors". Your Computer.

"The world's best personal computer for under £500."

Chris Sinclair

Sinclair ZX Spectrum
16K RAM £125, 48K RAM £175.

This is the astonishing new ZX Spectrum – a powerful professional's computer in everything but price!

There are two versions – 16K or a really powerful 48K. Both have a full 8 colours, sound generation, a full-size moving-key keyboard and high-resolution graphics. Plus established Sinclair features such as 'one-touch' keyword entry, syntax check and report codes!

Key features of the Sinclair ZX Spectrum

Full colour – 8 colours plus flashing and brightness-intensity control.

Sound – BEEP command with variable pitch and duration.

Massive RAM – 16K or 48K.

Full-size moving-key keyboard – all keys at normal typewriter pitch, with repeat facility on each key.

High resolution – 256 dots horizontally x 192 vertically, each individually addressable for true high-resolution graphics.

ASCII character set – with upper- and lower-case characters.

High speed LOAD & SAVE – 16K in 100 seconds via cassette, with VERIFY and MERGE for programs and separate data files.

The ZX Printer – available now

The printer offers ZX Spectrum owners the full ASCII character set – including lower-case characters and high-resolution graphics.

Printing speed is 50 characters per second, with 32 characters per line and 9 lines per vertical inch.

ZX Microdrive – coming soon

Each Microdrive will hold up to 100K bytes on a single interchangeable microfloppy – with a transfer rate of 16K bytes per second. And you'll be able to connect up to 8 ZX Microdrives to your ZX Spectrum – they're available later this year, for around £50.

How to order your ZX Spectrum

BY PHONE – Access, Barclaycard or Trustcard holders can call 01-200 0200 for personal attention 24 hours a day, every day.

BY FREEPOST – use the coupon below. You can pay by cheque, postal order, Access, Barclaycard or Trustcard.

EITHER WAY – please allow up to 28 days for delivery. And there's a 14-day money-back option, of course. We want you to be satisfied beyond doubt – and we have no doubt that you will be.

sinclair
ZX Spectrum

Sinclair Research Ltd,
Stanhope Road, Camberley, Surrey, GU15 3PS. Tel: Camberley (0276) 685311.

To: Sinclair Research, FREEPOST, Camberley, Surrey, GU15 3BR. **Order**

Qty	Item	Code	Item price £	Total £
	Sinclair ZX Spectrum – 16K RAM version	100	125.00	
	Sinclair ZX Spectrum – 48K RAM version	101	175.00	
	Sinclair ZX Printer	27	59.95	
	Printer paper (pack of 5 rolls)	16	11.95	
	Postage and packing: orders under £100	28	2.95	
	orders over £100	29	4.95	
			TOTAL £	

Please tick if you require a VAT receipt ☐

*I enclose a cheque/postal order payable to Sinclair Research Ltd for £_____

*Please charge to my Access/Barclaycard/Trustcard account no. Please print

*Please delete/complete as applicable.

Mr/Mrs/Miss

Address

FREEPOST – no stamp needed. Prices apply to UK only. Export prices on application. CVG 809

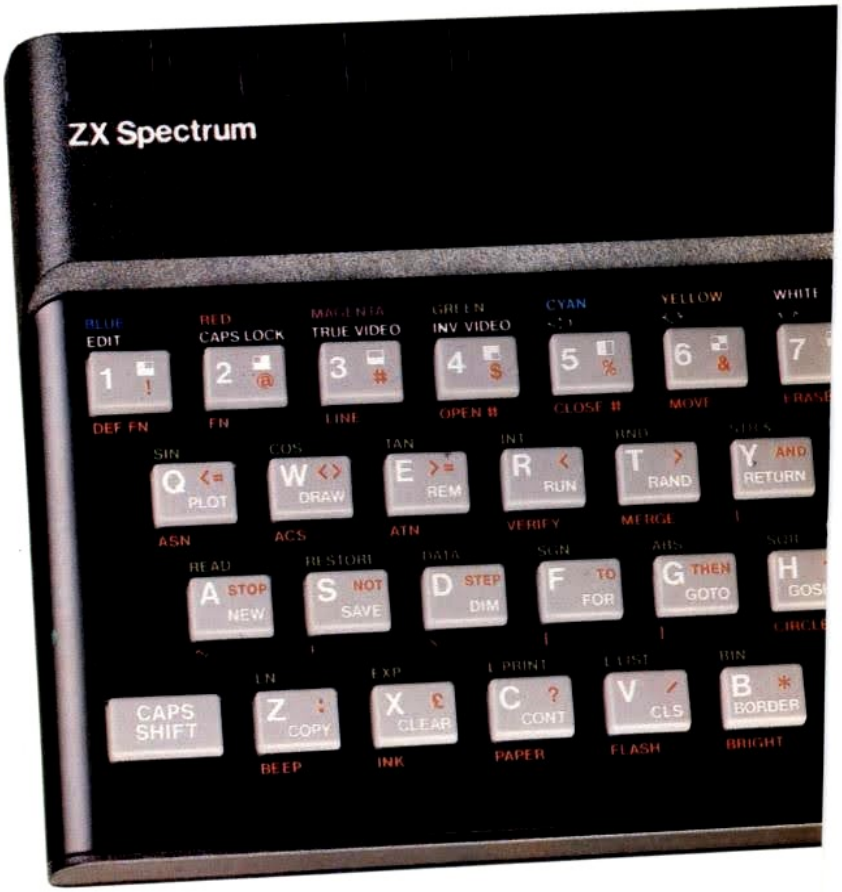
ZX Spectrum

BLUE EDIT
RED CAPS LOCK
MAGENTA TRUE VIDEO
GREEN INV. VIDEO
CYAN
YELLOW
WHITE
GRAPHICS
BLACK DELETE
1 ! DEF FN
2 @ FN
3 # LINE
4 $ OPEN #
5 % CLOSE #
6 & MOVE
7 ' ERASE
8 (POINT
9) CAT
0 _ FORMAT
SIN Q ⇐ PLOT ASN
COS W <> DRAW ACS
TAN E >= REM ATN
INT R < RUN VERIFY
RND T > RAND MERGE
STR$ Y AND RETURN
CHR$ U OR IF
CODE I AT INPUT IN
PEEK O ; POKE OUT
TAB P " PRINT @
READ A STOP NEW ~
RESTORE S NOT SAVE |
DATA D STEP DIM \
SGN F TO FOR {
ABS G THEN GOTO }
SQR H ↑ GOSUB CIRCLE
VAL J − LOAD VAL $
LEN K + LIST SCREEN $
USR L = LET ATTR
ENTER
CAPS SHIFT
LN Z : COPY BEEP
EXP X £ CLEAR INK
LPRINT C ? CONT PAPER
LLIST V / CLS FLASH
BIN B * BORDER BRIGHT
IN KEY$ N · NEXT OVER
PI M · PAUSE INVERSE
SYMBOL SHIFT
BREAK SPACE

Sinclair ZX Spectr

16K or 48K RAM... full-size moving-key keyboard... colour and sound... high-resolution graphics...

From only £125!



First, there was the world-beating Sinclair ZX80. The first personal computer for under £100.

Then, the ZX81. With up to 16K RAM available, and the ZX Printer. Giving more power and more flexibility. Together, they've sold over 500,000 so far, to make Sinclair world leaders in personal computing. And the ZX81 remains the ideal low-cost introduction to computing.

Now there's the ZX Spectrum! With up to 48K of RAM. A full-size moving-key keyboard. Vivid colour and sound. High-resolution graphics. And a low price that's unrivalled.

Professional power–personal computer price!

The ZX Spectrum incorporates all the proven features of the ZX81. But its new 16K BASIC ROM dramatically increases your computing power.

You have access to a range of 8 colours for foreground, background and border, together with a sound generator and high-resolution graphics.

You have the facility to support separate data files.

You have a choice of storage capacities (governed by the amount of RAM). 16K of RAM (which you can uprate later to 48K of RAM) or a massive 48K of RAM.

Yet the price of the Spectrum 16K is an amazing £125! Even the popular 48K version costs only £175!

You may decide to begin with the 16K version. If so, you can still return it later for an upgrade. The cost? Around £60.

Ready to use today, easy to expand tomorrow

Your ZX Spectrum comes with a mains adaptor and all the necessary leads to connect to most cassette recorders and TVs (colour or black and white).

Employing Sinclair BASIC (now used in over 500,000 computers worldwide) the ZX Spectrum comes complete with two manuals which together represent a detailed course in BASIC programming. Whether you're a beginner or a competent programmer, you'll find them both of immense help. Depending on your computer experience, you'll quickly be moving into the colourful world of ZX Spectrum professional-level computing.

There's no need to stop there. The ZX Printer – available now – is fully compatible with the ZX Spectrum. And later this year there will be Microdrives for massive amounts of extra on-line storage, plus an RS232 / network interface board.

Key features of the Sinclair ZX Spectrum

- Full colour – 8 colours each for foreground, background and border, plus flashing and brightness-intensity control.
- Sound – BEEP command with variable pitch and duration.
- Massive RAM – 16K or 48K.
- Full-size moving-key keyboard – all keys at normal typewriter pitch, with repeat facility on each key.
- High-resolution – 256 dots horizontally x 192 vertically, each individually addressable for true high-resolution graphics.
- ASCII character set – with upper- and lower-case characters.
- Teletext-compatible – user software can generate 40 characters per line or other settings.
- High speed LOAD & SAVE – 16K in 100 seconds via cassette, with VERIFY & MERGE for programs and separate data files.
- Sinclair 16K extended BASIC – incorporating unique 'one-touch' keyword entry, syntax check, and report codes.

um

The ZX Printer – available now

Designed exclusively for use with the Sinclair ZX range of computers, the printer offers ZX Spectrum owners the full ASCII character set – including lower-case characters and high-resolution graphics.

A special feature is COPY which prints out exactly what is on the whole TV screen without the need for further instructions. Printing speed is 50 characters per second, with 32 characters per line and 9 lines per vertical inch.

The ZX Printer connects to the rear of your ZX Spectrum. A roll of paper (65ft long and 4in wide) is supplied, along with full instructions. Further supplies of paper are available in packs of five rolls.

The ZX Microdrive – coming soon

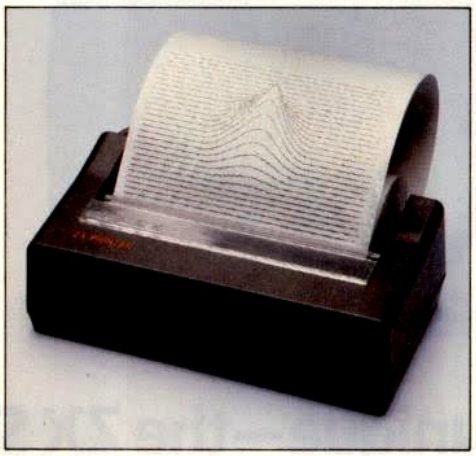
The new Microdrives, designed especially for the ZX Spectrum, are set to change the face of personal computing.

Each Microdrive is capable of holding up to 100K bytes using a single interchangeable microfloppy.

The transfer rate is 16K bytes per second, with average access time of 3.5 seconds. And you'll be able to connect up to 8 ZX Microdrives to your ZX Spectrum.

All the BASIC commands required for the Microdrives are included on the Spectrum.

A remarkable breakthrough at a remarkable price. The Microdrives are available later this year, for around £50.



RS232 / network interface board

This interface, available later this year, will enable you to connect your ZX Spectrum to a whole host of printers, terminals and other computers.

The potential is enormous. And the astonishingly low price of only £20 is possible only because the operating systems are already designed into the ROM.

ZX Spectrum

Available only by mail order and only from

sinclair

Sinclair Research Ltd,
Stanhope Road, Camberley,
Surrey, GU15 3PS.
Tel: Camberley (0276) 685311.

How to order your ZX Spectrum

BY PHONE – Access, Barclaycard or Trustcard holders can call 01-200 0200 for personal attention 24 hours a day, every day. BY FREEPOST – use the no-stamp needed coupon below. You can pay by cheque, postal order, Barclaycard, Access or Trustcard.

EITHER WAY – please allow up to 28 days for delivery. And there's a 14-day money-back option, of course. We want you to be satisfied beyond doubt – and we have no doubt that you will be.

To: Sinclair Research, FREEPOST, Camberley, Surrey, GUI5 3BR. **Order**

Qty	Item	Code	Item Price £	Total £
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	Sinclair ZX Spectrum – 48K RAM version	101	175.00	
	Sinclair ZX Printer	27	59.95	
	Printer paper (pack of 5 rolls)	16	11.95	
	Postage and packing: orders under £100	28	2.95	
	orders over £100	29	4.95	
			Total £	

Please tick if you require a VAT receipt ☐

*I enclose a cheque/postal order payable to Sinclair Research Ltd for £ _____

*Please charge to my Access/Barclaycard/Trustcard account no.

*Please delete/complete as applicable

Signature

PLEASE PRINT

Name: Mr/Mrs/Miss

Address

PCW 810

FREEPOST – no stamp needed. **Prices apply to UK only.** **Export prices on application.**

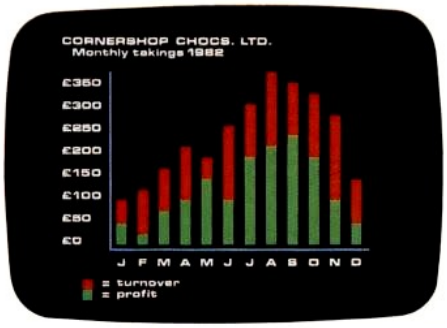
ZX Spectrum software: how good and how soon?

The ZX Spectrum uses an enhanced version of Sinclair BASIC, fast becoming a world standard, and unlikely to be superseded. Unique features, such as one-touch keyword entry and syntax check and report, are increasingly attracting software originators.

Building the software library is already far advanced, and a complete catalogue will be available in the next few months. Subjects will include sophisticated games, education, 'housekeeping', and business management. The more complex packages can, of course, be used to their best advantage with the full 48K RAM version of the ZX Spectrum.

The Sinclair ZX Spectrum can handle sophisticated games programs with high-resolution colour graphics and sound.

This major advance in computer technology maintains Britain's world-beating position in the field of personal computers.



A range of business software will soon be available, covering both specific applications (eg stock-control and payroll) and general business management systems (eg matrix models).

This second generation of Sinclair personal computers demonstrates continuing commitment. Advanced technology made the ZX80/81 family a price breakthrough: advanced technology makes the ZX Spectrum a breakthrough in price and performance.

Elegant, effective, unique—the ZX Spectrum design.

'Less than half the price of its nearest competitor – and more powerful.'

'These two pictures show how it's done. On the right is the PCB from the BBC Model A Microcomputer. On the left is the PCB from the ZX Spectrum.

'It's obvious at a glance that the design of the Spectrum is more elegant. What may not be so obvious is that it also provides more power.

'The ZX Spectrum has more usable RAM, and higher maximum RAM.

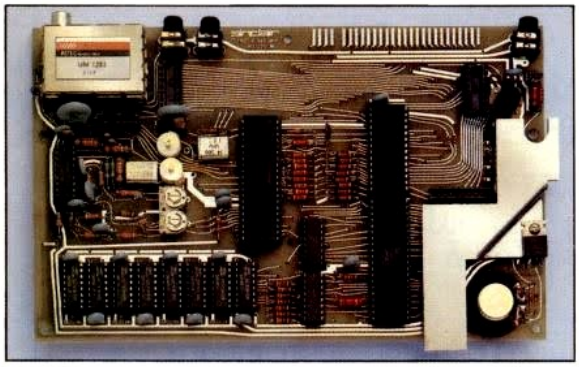
'It offers twice as many colours on the screen at any one time, plus a colour brightness control. It also offers user-definable graphics.

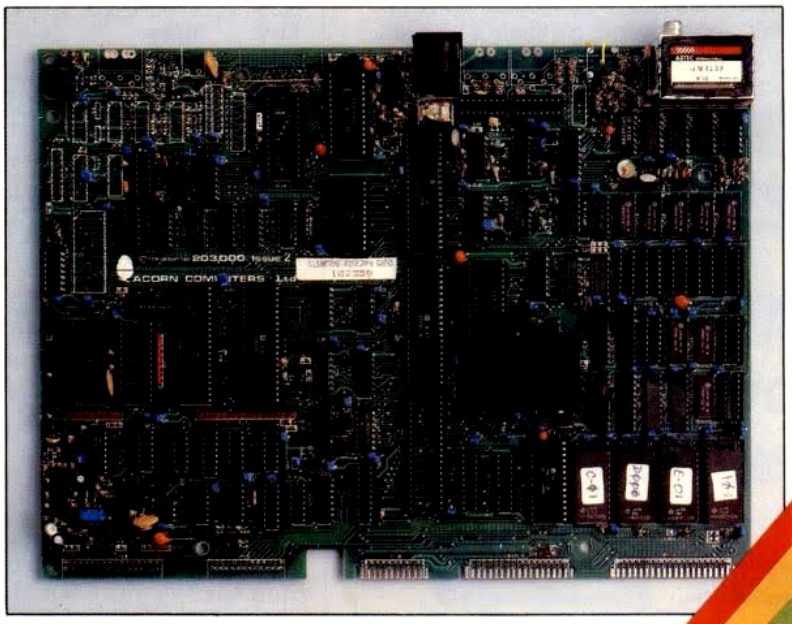
'It has data transfer rate 25% faster, supported by a VERIFY facility.

'And it employs a dialect of BASIC (Sinclair BASIC) already in use in over 500,000 computers worldwide.

'We believe the BBC make the world's best TV programmes – and that Sinclair make the world's best computers!'

– Clive Sinclair.





Above left: internal layout of Sinclair ZX Spectrum.

Right: Internal layout of BBC Micro Model A.

The illustrations are to the same scale, and demonstrate the rate of advance in microcomputer design. The ZX Spectrum uses just 14 chips to provide more power and more user-available RAM.

sinclair ZX Spectrum

Probably the fastest microcomputer in the universe

the JUPITER ACE only £89.95.

All inclusive Price

For £89.95 you receive your Jupiter Ace, a mains adaptor, all the leads needed to connect to most cassette recorders and T.V.s (colour or black and white), a software catalogue and a manual.

The manual is a complete introduction to the world of personal computing and a course in FORTH programming on the Ace.

Even if you are a complete newcomer to computers, the manual will guide you step by step from first principles to confident programming.

The price includes postage packing and V.A.T.

Key Features

- Revolutionary microcomputer language FORTH.
- Full-size moving-key keyboard.
- User-defined high-resolution graphics.
- Programmable sound generator.
- Floating point arithmetic.
- Fast cassette interface.
- Upper and lower case ascii character set.
- 24 x 32 character flicker-free display.

The Jupiter Ace uses FORTH

The Ace is set apart from all other personal computers on the market by its use of a revolutionary language called 'FORTH'. Some computer languages are easy for humans to understand, others are easy for computers; FORTH is most unusual in being both. Its underlying principles are so simple that it takes even a newcomer to computers only a few minutes to learn how to do calculations on the Ace, yet the very same principles are powerful enough to allow you to invent your own extensions to the language itself.

At the same time, the memory-saving coded form used to store your programs inside the Ace allows it to obey them very fast — typically in less than a tenth of the time it would take to do the same thing using a different language. Amongst other things, this makes the Ace ideal for "games".

FORTH's unique combination of speed, versatility and ease of programming has already made it a prime choice for professional applications as diverse as pub games and radio telescopes, and gained it an enthusiastic national user group. Now the Jupiter Ace can bring this addictive language into your own home.

Designed by Jupiter Cantab

Leading computer Designers Richard Altwasser and Steven Vickers have a reputation for pushing technology forwards. After playing the major role in creating the ZX Spectrum they formed Jupiter Cantab to develop their latest brainchild the Jupiter Ace.

Technical Specification

Hardware

Processor/Memory
Z80A running at 3.25 MHz. 8K bytes ROM 3K bytes RAM.

Input
40 moving-key keyboard with auto-repeat on every key.

Output
Memory-mapped 32 x 24 character display with high resolution user graphics. Output to drive normal UHF TV set on channel 36.

Sound
Provided by internal loudspeaker.

Cassette
Load Save & Verify at 1500 baud, separate data storage.

Software, FORTH

Data Structures
Integer, Floating point and String data may be held as constants, variables or arrays with multiple dimensions and mixed data types.

Control Stuctures
IF-THEN-ELSE, DO-LOOP, BEGIN-WHILE-REPEAT, BEGIN-UNTIL, all may be mixed and nested to any depth.

Operators
Mathematical +, —, X, ÷.
Logical AND, OR, NOT, XOR.
Comparison <, >, =.

Program Editing
FORTH words may be listed, edited and redefined. Comments are preserved when words are compiled.

Order Form

The **Jupiter Ace** is available only by mail order. Please allow up to 28 days for delivery.

Send cheque or postal order with the form to:—
JUPITER CANTAB, 22 FOXHOLLOW, BAR HILL, CAMBRIDGE CB3 8EP

Please send me:—

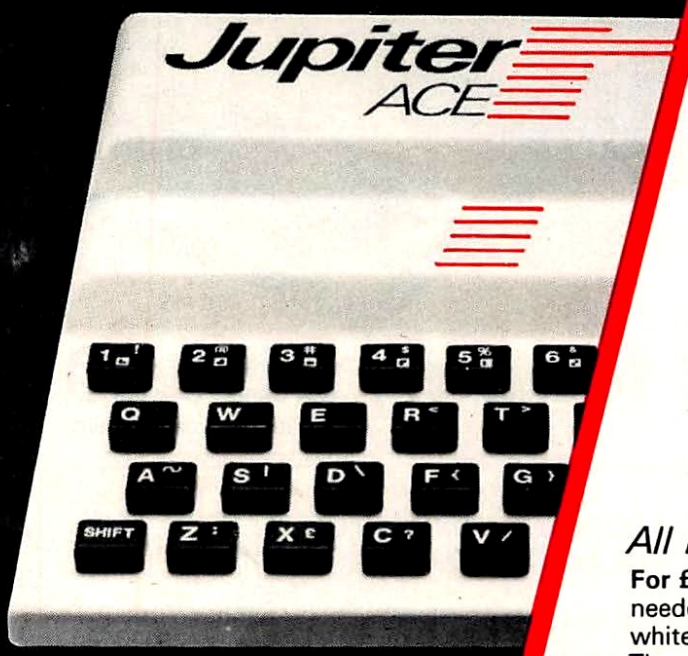
☐ JUPITER ACE MICROCOMPUTER(S) @ £89.95.

Name, Mr/Mrs/Miss

Address

CVG

Jupiter ACE



The Jupiter Ace personal computer runs in FORTH, an easily understood language, typically four times as compact and ten times as fast as BASIC. Before the Ace all personal computers used BASIC and FORTH was only available to a privileged few.

The Jupiter Ace also features a full-size moving-key keyboard, high-resolution graphics, sound, floating point arithmetic, a fast and reliable cassette interface and 3K of RAM.

If you own a personal computer you will be aware of the limitations of BASIC. You know how slowly your programs run and how quickly your computer's memory gets filled. The Jupiter Ace is your answer.

If you already know FORTH, the Jupiter Ace closely follows the FORTH 79 standard with extensions for floating point, sound and cassette. It has a unique and remarkable editor that allows you to list and alter words that have been previously compiled into the dictionary. This avoids the need to store screens of source, allowing the dictionary itself to be saved on cassette. Comprehensive error checking removes the worry of accidentally crashing your programs.

All inclusive price

For £89.95 you receive your Jupiter Ace, a mains adaptor, all the leads needed to connect to most cassette recorders and T.V.s (colour or black and white), a software catalogue and a manual.
The manual is a complete introduction to the world of personal computing and a course in FORTH programming on the Ace.
Even if you are a complete newcomer to computers, the manual will guide you step by step from first principles to confident programming.
The price includes postage, packing and V.A.T.
The Jupiter Ace is backed by a full 12 month warranty.

"The Ace is an excellent way of using FORTH"

Popular Computing Weekly

Available soon

Plug-on parallel printer interface.
For around £20.00 this will connect your Jupiter Ace to anything from high-speed dot matrix to letter-quality daisy wheel printers.

Plug-on 16K Memory Expansion
For around £30.00 you will increase the memory of your Jupiter Ace to 19K giving you instant access to enormous amounts of information.

Software
A catalogue will be sent with every machine, and includes, initially, programs for education and entertainment.

"FORTH is an easy language"

Byte

FORTH Finishes First!

Speed Comparison Chart showing times in seconds to perform one thousand operations.

Type of Operation	Jupiter Ace	BBC Micro	Vic 20	Spectrum	ZX81
Empty loop	0.12	0.67	1.3	4.2	17.7
Print a number	7.5	13.5	26	19	430
Print a character	0.62	1.3	3.1	7.5	24
Add two numbers	0.45	1.4	5.5	7.5	28
Multiply two numbers	0.9	1.6	6.5	7.5	32

Because of the difficulty in devising exactly equivalent programs, these measurements should only be taken as a guide.

only £89.95

Designed by Jupiter Cantab

Computer Designers Steven Vickers and Richard Altwasser played a major role in creating the ZX Spectrum and then formed Jupiter Cantab to develop advanced ideas in personal computing. The Ace is the result, another all-British computer to lead the world.

Technical Information

Hardware
Z80A running at 3.25 MHz.
8K bytes ROM
3K bytes RAM

Keyboard
40 Moving-key keyboard with auto repeat on every key and Caps Lock.

Screen
Memory mapped 32 column x 24 line flicker-free display with upper and lower case ascii character set.

Graphics
Chunky graphics (64 x 46 pixels) may be plotted, unplotted or over-plotted (XOR operation). Also, the entire character set (128 characters and their video inverses) may be redefined allowing intricate shapes to be drawn with a resolution equivalent to 256 x 192 pixels.

Control Structures
IF–ELSE–THEN, DO–LOOP DO–+LOOP, BEGIN–WHILE–REPEAT, BEGIN–UNTIL, all may be mixed and nested to any depth.

Cassette
Programs and data in the compact dictionary format may be saved, verified, loaded and merged. Blocks of memory can be saved, verified, loaded and relocated. All tape files are named. Running at 1500 baud, the Ace will connect to most portable tape recorders.

Expansion Port
Contains D.C. power rails and full Z80 Address, data and control signals. May be used to connect extra memory and other peripherals. IN and OUT words allow port-based peripherals to be addressed.

Data Structures
Integer, Floating point and String data may be held as constants, variables or arrays with multiple dimensions and mixed data types. There are no restrictions on names.

Sound
Internal loudspeaker may be programmed to operate over the entire audio spectrum.

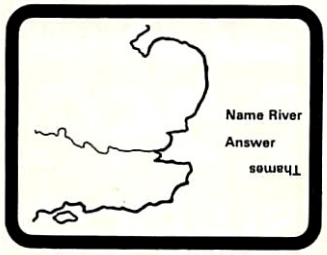
Programming in FORTH

Programming in FORTH
FORTH programs are constructed without line-numbers, as words which are defined in terms of other words that already exist. Consider the following definition of the word **STARS**. Comments are in parenthesis and have no action.

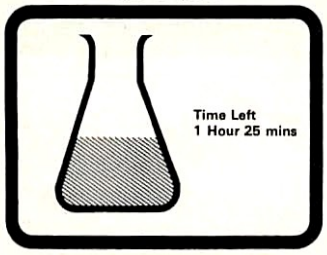
```
: STARS          (: starts word definition)
  " *** "        (print 3 asterisks)
  200 100 BEEP   (play a note for
                  100 mSecs)
;
```

The semi colon at the end finishes the word definition. Now, whenever you say **STARS** the computer will print out 3 asterisks and sound a short tone. (Notice how the word **BEEP** comes after the numbers it uses, 200 and 100. This characteristic occurs throughout FORTH so that you write, for instance, 28 76 + instead of 28 + 76.)

The Jupiter Ace already has 140 FORTH words defined in ROM.

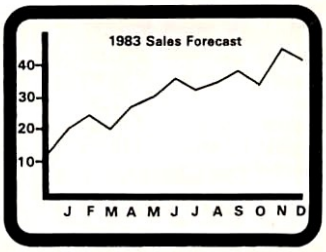


In Schools Teachers already know how quickly children take to computing, and the Jupiter Ace is an ideal introduction. FORTH is an easy and important language to learn and by making learning fun, the Ace can help to teach science, music and many other subjects.



In Laboratories For monitoring and controlling experiments, the Jupiter Ace has many advantages. The language is perfect, even the Jodrell Bank Radio Telescope is controlled in FORTH. The Ace expansion port enables it to be interfaced to almost anything, and the built in quartz timer allows experiments to run all weekend.

At Home The Jupiter Ace is powerful enough to play games as complex as Chess and with sound and high resolution graphics, action games written in FORTH will stretch your reaction speeds to their limits.



In the Office Stock control, Accounts and Financial forecasts are all possible on the Jupiter Ace. With a printer and extra memory attached you can do word processing as well.

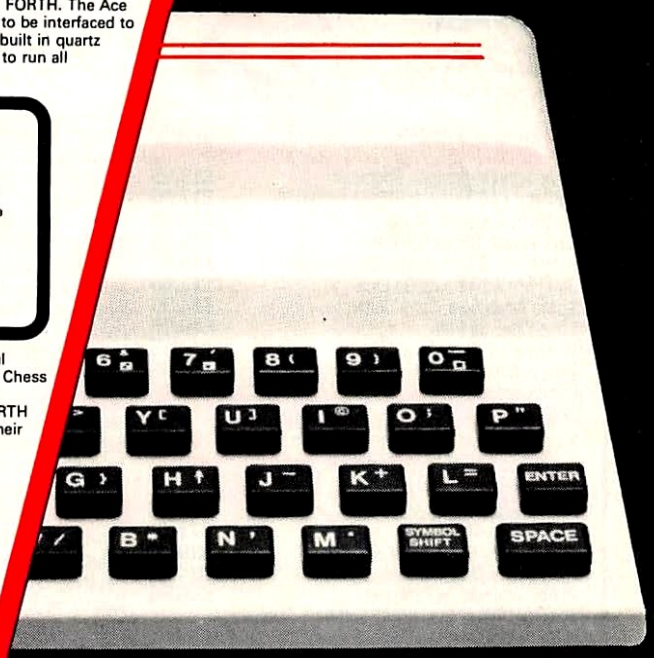
"FORTH is very flexible"

"FORTH is compact"

Electronics and computing

"FORTH is in general very much faster than BASIC"

Computing Today



ORDER NOW!

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VIC 20

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- Centronics printer interface and cassette port
- Comprehensive user manual

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incl VAT

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COMING SOON, TO COMPLETE YOUR SYSTEM: ORIC MICRO-DRIVE DISCS & SPEED PRINTER

FOR HOME: The ORIC-1 is the professional alternative for home computing. Superbly styled, the 57 key layout is based upon computers costing many times more than the ORIC, and will help the whole family to learn and understand computing, right from day one. The ORIC incorporates an improved version of Microsoft Basic for ease of programming and use. For the enthusiasts the computer has laser zaps, explosions, etc. pre-programmed for games use, with Hi-Fi output for incredible effect. The communications Modem will allow 'Telesoftware', message sending, and Prestel use.

FOR BUSINESS: The ORIC-1 is the answer to many day to day problems. Software is becoming available for payroll, accounts, stock-control, and many more systems to help your day to day business organising and control. In addition, the ORIC COMMUNICATIONS MODEM will allow you to access up to 200,000 pages of Prestel information, to send and receive 'electronic mail', to book hotels, and flights (and pay for them) and to look at the latest stock-market and share indexes.

In short the ORIC-1 is a must for all businesses large or small.

HOW TO ORDER YOUR ORIC-1: By phone: Just ring our telesales number Ascot (0990) 27641.

By post: You can pay by cheque, postal order ACCESS – BARCLAYCARD – AMEX – DINERS. (Please allow 28 days for delivery).

Money back if not satisfied.

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ORIC-1

The Real Computer System

ORIC PRODUCTS INTERNATIONAL LTD Coworth Park Mansion, Coworth Park, London Road, Sunninghill, Ascot, Berks SL5 7SE.

Item	Qty	Price Inc VAT
ORIC-1 16K RAM		£ 99.95
ORIC-1 48K RAM		£169.95
ORIC Communications Modem		£ 49.95
Postage and Packing		£ 5.95
	TOTAL £	

Please charge my Access, Barclaycard Amex, Diners Club account no.

Name

Address

*Please delete/complete as applicable.
*I enclose a cheque/P.O. payable to: ORIC PRODUCTS INTERNATIONAL LIMITED for £

If you require a brochure please tick ☐

PCW

How to increase the

Anyone with even a limited knowledge of home computers will instantly recognise the very large advantages of owning a Lynx.

And anyone who truly understands the considerable differences between home computers is likely to have spotted The Lynx a mile off.

With 48K of memory to start with, The Lynx far outweighs the majority of home computers on the market.

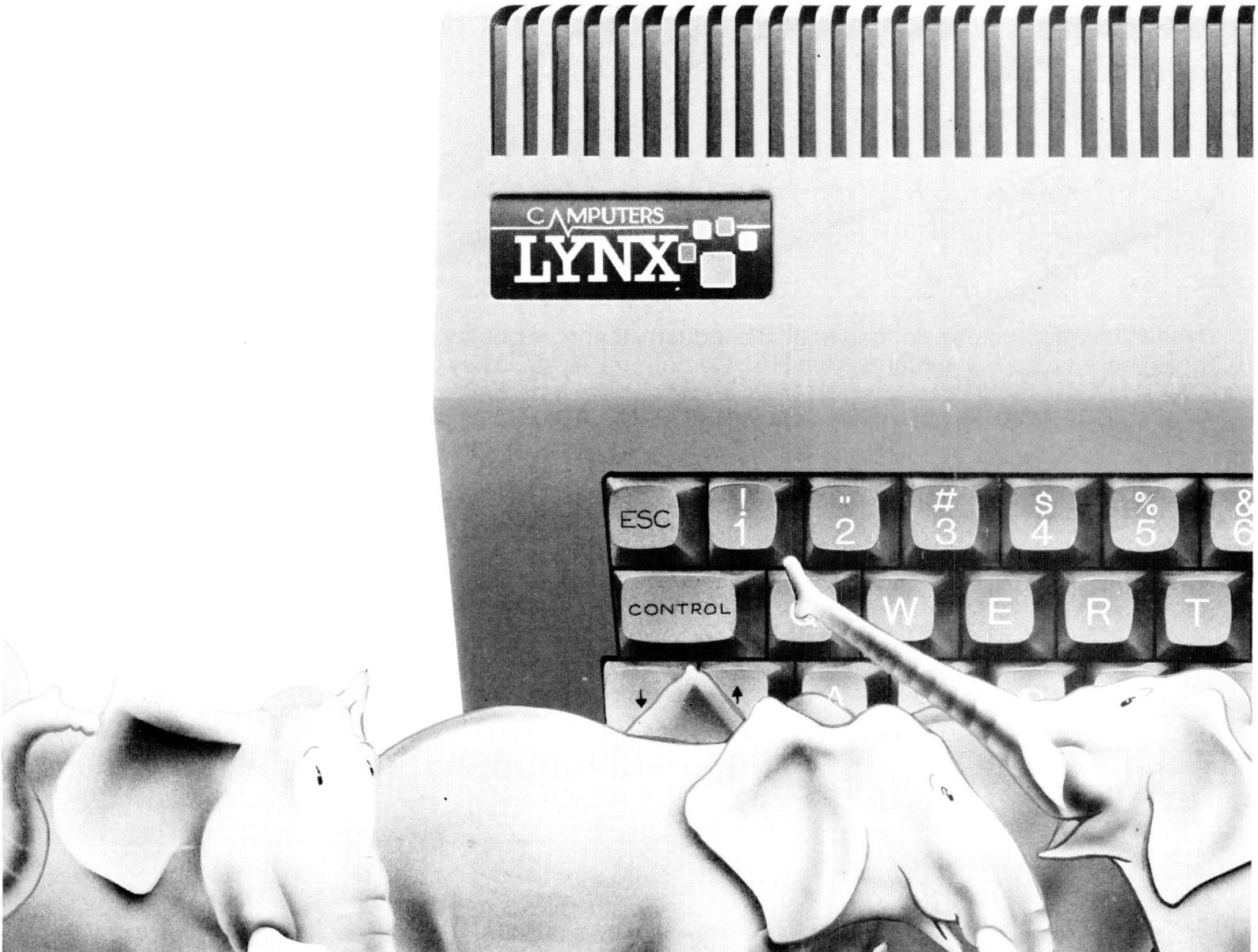
And it is precisely that size of memory which makes The Lynx a superior anim in its field.

What's more, 48K of memory is not th end of its capacity, but merely the beginnin

Your Lynx can grow. To 96K, to 128K, to 192K. All inboard.

All of a sudden your Lynx home computer has assumed the size of memo usually associated with business machine

Its increased capacity will mean y can have an impressive word processor.



ize of your memory.

Disk drives and printers, mono or
our monitors can be added on.

With an RS232 port, your Lynx home
nputer is compatible with a wide range
other manufacturers' equipment.

And CP/M® compatibility opens the
or to a comprehensive selection of
siness software.

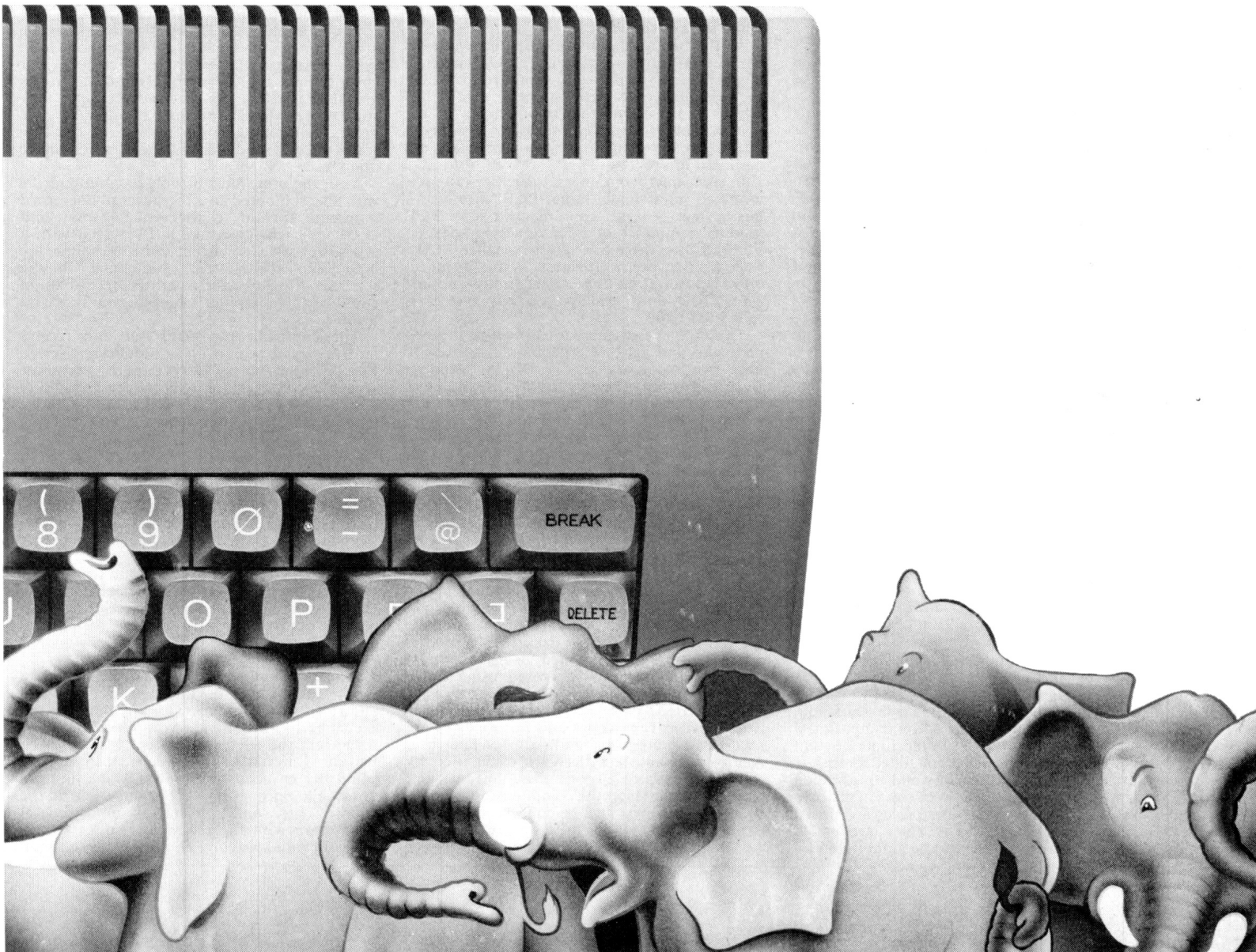
Furthermore, your Lynx home
mputer has high resolution colour
aphics.

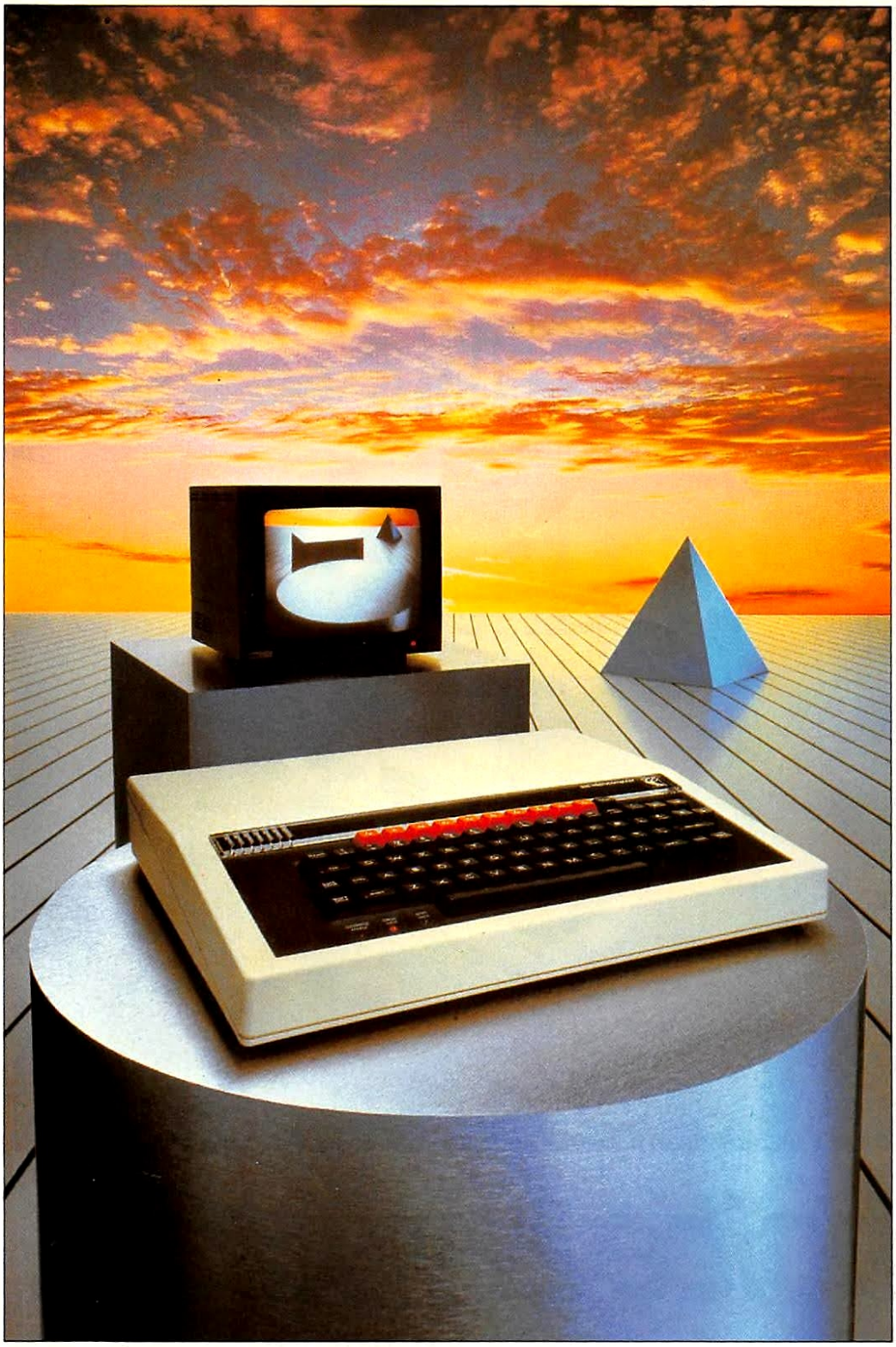
In other words, you are free to draw in
all 8 colours anywhere on the screen.

For the full story about The Lynx home
computer, write to Camputers Ltd.,
33a Bridge Street, Cambridge CB2 1UW
and we'll send you a brochure and the
name of your nearest stockist.

®CP/M is the registered trade mark of Digital Research Inc.

CAMPUTERS
LYNX





'Whether your interests lie in business, educational, scientific, control or games applications, this system provides a possibility for expansion which is unparalleled in any other machine available at present,' comments Paul Beverley in the July 1982 edition of *Personal Computer World*.

The BBC Microcomputer can genuinely claim to satisfy the needs of novice and expert alike. It is a fast, powerful system generating high resolution colour graphics and which can synthesise music and speech. The keyboard uses a conventional layout and electric typewriter 'feel.'

You can connect directly* to cassette recorder, domestic television, video monitor. disc drives, printers (dot matrix and daisy wheel) and paddles. Interfaces include RS423, inter-operable with RS232C equipment, and Centronics. There is an 8-bit user port and 1MHz buffered extension bus for a direct link to Prestel and Teletext adaptors and many other expansion units. The Econet system allows numerous machines to share the use of expensive disc drives and printers.

BASIC is used, but plug-in ROM options will allow instant access to other high level languages (including Pascal, FORTH and LISP) and to word processing software.

A feature of the BBC Microcomputer which has attracted widespread interest is the Tube, a design registered by Acorn Computers. The Tube is unique to the BBC Microcomputer and greatly enhances the expandability of the system by providing, via a high speed data channel for the addition of a second processor. A 3MHz 6502 with 64K of RAM will double processing speed; a Z80 extension will make it fully CP/M** compatible.

The BBC Microcomputer is also at the heart of a massive computer education programme. The government has recommended it for use in both primary and secondary schools. The BBC Computer Literacy Project includes two series of television programmes on the use and applications of computers.

There are two versions of the computer. Model A, at £299, offers 16K of RAM and Model B at £399 has 32K of RAM.

For technical specification and order form, send stamped addressed envelope to P.O. Box 7, London W3 6XJ and for details of your nearest stockist ring 01-200 0200.

Broader horizons

The BBC Microcomputer System

*Model A has a limited range of interfaces but can be upgraded to meet Model B specification.
**CP/M is a registered trade mark of Digital Research.

The BBC Microcomputer is designed, produced and distributed in the UK by Acorn Computers Limited.

1983

ORIC~1™

Tomorrow's micro...today!

HOME COMPUTING

Games and leisure play an important part in the home use of your computer. The superb colour graphics and sound of ORIC-1 will add dynamic realism to your games software, unmatched by other home computers.

Experience full colour, high resolution space-invaders, with arcade/hi-fi sound effects. Chess that never cheats or simulator games such as landing an aircraft. The advanced capabilities of ORIC-1 start to give you real games and simulations where other home computers leave off. That's the ORIC difference. Plus all the capability you need for traditional uses such as home finances and accounts.

EDUCATIONAL COMPUTING

Computers already play an important role in todays modern offices and industry. It is essential that children being educated today for tomorrow's high technology world, are equipped to learn and understand computer technology if they are to succeed. Many schools and colleges use computers these days, but often do not have sufficient for individual tuition. An ORIC-1 computer in your home will give your children the "hands-on" experience they need, and because ORIC-1 is based on REAL computing systems, it will help all the family understand the heart of this new technology, as well as help with homework, language learning, and give access to a wealth of knowledge that will guide you into the world of Information Technology and Data Processing.

BUSINESS WITH ORIC-1

The ORIC-1 is a high quality, professional MicroComputer with a specification comparable to those costing many times more.

Many software packages are already running on the Basic Language, which include Word Processing, Accounting Packages, Stock-Control Systems, Sales Forecasting, etc.

Using the Oric with its MODEM enables the businessman to send and receive electronic mail via the Prestel Mailbox system, and to access over 200,000 pages of vital information including up to the minute stocks and shares prices, all aspects of travel, with timetables, commodity prices, news media and farming information and a whole wealth more.

THE ORIC-1 SHOULD BE ON THE DESK OF EVERY INFORMED EXECUTIVE.

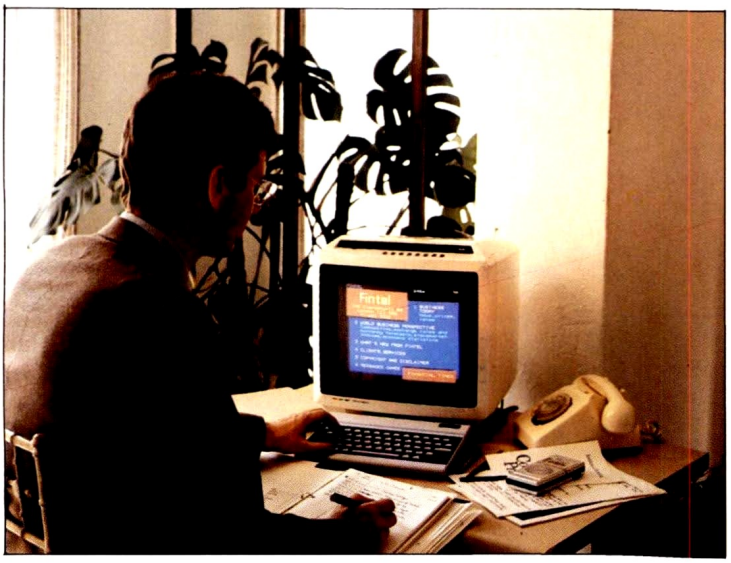
COMMUNICATIONS WITH ORIC-1

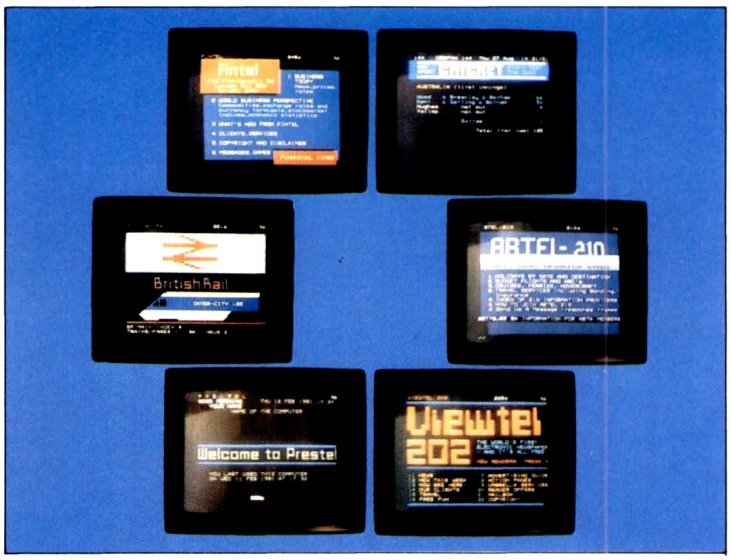
Because the ORIC-1 has graphics that are Prestel/Viewdata compatible, it can be used with the ORIC MODEM to give a host of communications facilities, including **200,000** pages of interactive information covering sport, travel, hotel bookings, games, quizzes, etc., plus **TELESHOPPING**.

TELESOFTWARE enables ORIC users to download (either very cheaply or free of charge) software direct from Prestels'* ALADDIN'S CAVE, via your own telephone.

ELECTRONIC MAIL – the communications system of the future – enables ORIC users, via the Prestel Mailbox system, to send and receive information.

* Prestel – Trademark of British Telecoms Viewdata System.





The ORIC pedigree

The ORIC-1 is superbly designed and engineered. Its futuristic, slim line styling, looks equally good on the executive desk or in the home, and whilst the styling is Scandinavian, the Computer design is all British.

The "electronic heart" is unique to ORIC, and developed by a team of leading U.K. designers. The computing power of this micro is second to none in its class, and offers superb value for money.

ORIC-1 is a major development in MicroComputer design and engineering, with a pedigree that means quality and reliability to its discerning owners, all backed by full after sales service and a 12 month guarantee.

Now there is only one choice ~ ORIC.

CAREFULLY ASSESS THE FOLLOWING MAJOR ORIC FEATURES & TECHNICAL SUPERIORITY

COLOUR – ORIC plugs directly into the aerial socket of your T.V. and has an R.G.B. output if you require colour monitor quality.

The text and graphic displays are ultra bright, giving 40 characters of 28 rows. 8 foreground and 8 background colours can be displayed at any one time.

HIGH RESOLUTION GRAPHICS – A high resolution screen of 240 × 200 pixels (graphics dots) is displayed in full colour. Circles, lines and arcs can be drawn at very high speed for use with animated games, business graphics, or even computer art.

USER DEFINABLE GRAPHICS – with ORIC you have the choice of full Alpha Numeric computer standard character set, OR TELETEXT (CEEFAX/ORACLE) Alpha Mosaic graphics. The ORIC has, of course, Teletext/Viewdata compatible displays, plus the added bonus of being able to create up to 96 characters, of your own choice. Add to these features both Flashing and Double Height characters and you can start to appreciate the full capability of ORIC-1.

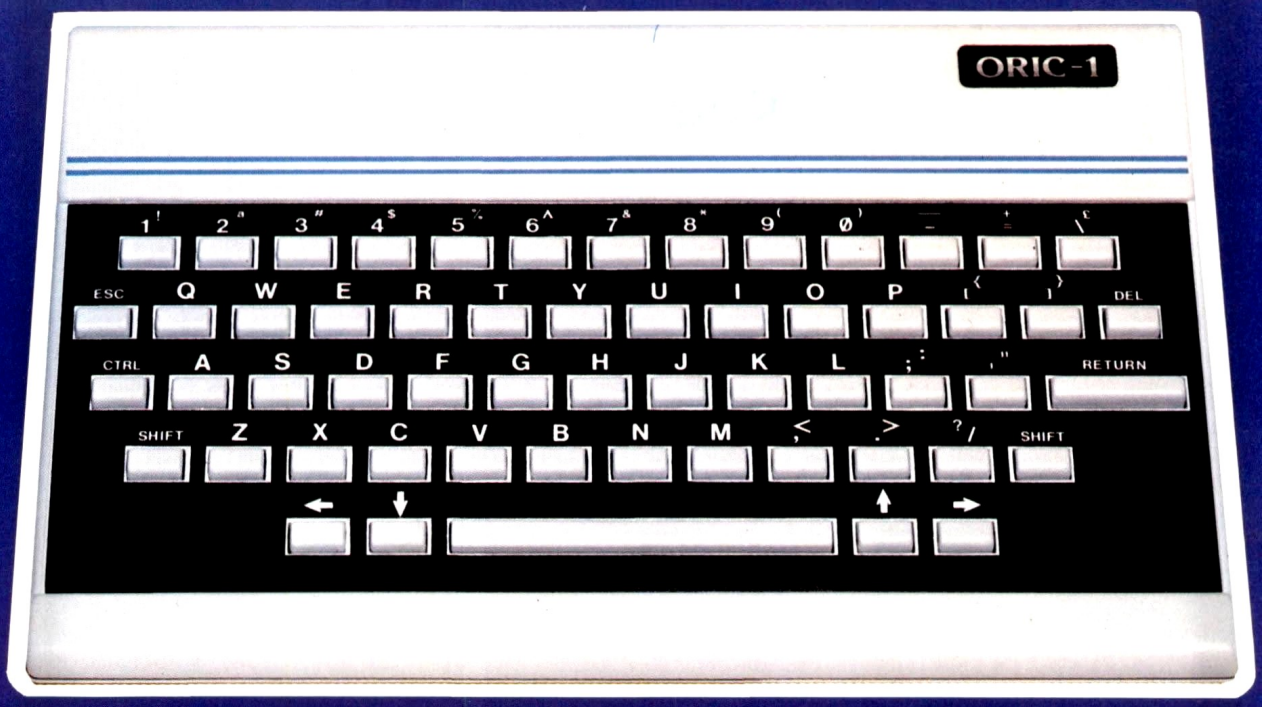
SOUND – The ORIC contains a high quality loudspeaker and a dedicated sound synthesiser circuit, producing a full 6 octaves of controllable sound.

Three different tones are available directly from the keyboard to facilitate touch type programming.

For beginners, 4 programmed sound effects – SHOOT – EXPLODE – PING – ZAP – are available for games and simulations etc.

You can even program your own sounds using "SOUND, MUSIC and PLAY" commands, giving the user full control over the dynamics of the sound.

The ergonomic, professional keyboard.



The computer keyboard has been ergonomically designed to enable the user to learn and remember the layout quickly. This driveability, as we call it, is essential for enjoyable speedy programming.

The 57 moving keys have only 2 functions each (not 6 or 7 as some micros) making familiarity with the keyboard a quick and easy process.

The keys have 3 feedback tones for the various functions which can be switched on and off at your convenience.

The keys themselves are well spaced, giving a pleasant tactile feel for ease of touch-typing and programming.

Very important features are the RESET & CURSOR CONTROL keys. The reset key enables the user to re-start a program without having to switch the power off and on. The cursor control keys are useful for ease of program editing and computer games.

The ORIC keyboard is **not** built down to a price, instead it is designed for maximum user 'driveability' and ease of use.

ORIC-1 TECHNICAL SPECIFICATION

CPU/Memory
6502A MicroProcessor with 16K ROM containing BASIC interpreter and operating system. RAM uses state of the art dynamic memories for high board density and low power dissipation. 16K Byte or optionally 48K Byte. 48K model contains 64K of RAM with 16K overlaid by ROM. External control signal allows the use of full 64K RAM or may be used to externally increase ROM.

Keyboard
57 moving keys with tactile feedback. Full upper and lower case with correctly positioned space bar. Full typewriter pitch. Key layout is standard computer type with ESC, CTRL, RETURN and additional cursor control keys. All keys have auto repeat.

Display
Will drive a PAL UHF colour or black and white television receiver. Approximately Channel 36. RGB output also provided on DIN socket with 270° configuration.

Screen – Character Mode (Memory Mapped)
28 lines of 40 characters producing display very similar to teletext. Normally the bottom 3 lines display control and system information. Character set is standard ASCII which is enhanced by the addition of 80 user definable characters. ASCII characters may also be re-defined as these are down loaded into RAM on power-up. Serial attributes are used to control display features, as in teletext, and take up one character position. All remaining characters on that line are affected by the serial attribute until either the line ends or another serial attribute. Display features are:–
a) Select background colour (paper) from one of eight.
b) Select foreground colour (ink) from one of eight.
c) Flash characters on and off approximately twice a second.
d) Produce double height characters (even line top, odd line bottom).
e) Switch over to user definable character set. This feature is used to produce teletext style colour graphics which does not require any additional RAM to operate.

Available colours are Black, Blue, Red, Magenta, Green, Cyan, Yellow and White. Each character position also has a parallel attribute, which may be operated on a character by character basis, to produce video inversion. The display has a fixed black border.

Screen – Graphics Mode (Memory Mapped)
200 pixels vertically by 240 pixels horizontally plus 3 lines of 40 characters (same as character mode) at the bottom of the screen to display system information and to act as a window on the user program while still viewing the graphics display. Can also be used to input direct commands for graphics and see effect instantly without having to switch modes. Graphics display operates with serial attributes in the same way as characters except that the display is now considered as 200 lines by 40 graphics cells. Each graphic cell is therefore 1 pixel by 6 pixels and is the pattern contained in RAM. Graphics display is therefore very flexible by having 8 foreground and 8 background colours and flashing patterns. The video invert parallel attribute is also useable in this mode. ASCII characters may be 'painted over' the graphics area thus enabling the free mixing of graphics and text.

Sound
Uses internal loudspeaker and amplifier and can also be connected to external Hi-Fi system via a DIN connector. A three channel sound synthesizer (The General Instrument 8912) as used in arcade games machines which can produce musical notes from sub-sonic to super-sonic frequencies. Envelope of sound output is programmable and can be used to synthesize various musical instruments. Pseudo Random Noise generator (producing a hissing sound) can be mixed into each channel). Provides interesting sound effects for video games.

Cassette Interface
Connect via DIN socket. Uses Tangerine format which has been field proven over 3 years and thousands of systems. Operates at super reliable 300 baud or reliable super fast 2400 baud. A tone leader allows tape recorders' automatic level control to stabilise before first recording file-name and then dumping program/data with parity lists. At the end of recording several check sums are recorded which will be checked on loading to verify correct operation.

A Schmitt trigger circuit is used on the tape input to remove noise. The Tangerine format is so good it is the one other manufacturers are copying. All types of information may be saved such as programs, data, arrays, blocks of memory, screen displays. After saving correct recording it may be verified before deleting information in memory. Remote motor control of tape recorder is provided; essential for the loading and saving of data files.

Expansion Port
Full data, address and control information for the 6502A MicroProcessor, for connection of Serial Modem and Network interfaces and Disk Pack or Micro Drives. Can also be used for user designed hardware interfaces. Useful control lines allow RAM and ROM to be externally expanded (ideal for adding ROM cartridges). Disk Pack and Micro Drives use these lines to provide 63K internal RAM on the 48K model.

Printer Port
Standard Centronics parallel interface allows connection of a multitude of different types of printer from very cheap thermal types to high speed matrix printers or wordprocessor quality daisy wheel printers. Port can double as 16 general purpose I/O lines.

Reset
Machine resets to character mode on power up and clears program memory. A key on the base of the machine provides a warm start which will return to the command mode (after a program crash or never ending loop) without destroying program or data.

Display Commands
Foreground and background colours are controlled by INK and PAPER commands and double height and flashing characters by DOUBLE AND FLASH.

INVERSE will give inverted colour printing. These commands (except DOUBLE) may also be set globally for all DRAW, CIRCLE AND PLOT commands and may be used in direct mode or within a program.

Sound Commands
Three tones can be produced directly from the keyboard.
a) A high beep when an alphanumeric key is pressed.
b) A low beep when a special key is pressed (e.g. Delete, Carriage Return).
c) A bell tone when the control G key is pressed.

The user can switch these sounds off as desired. There are four pre-programmed sound commands for use within programs. These are:
i) PING, produces a bell-like tone. Is also used as control G tone.
ii) SHOOT, simulates a gunshot.
iii) EXPLODE, creates the sound of an explosion.
iv) ZAP, produces a space-invader 'laser' sound.

To facilitate the creation of other sounds there are three general purpose commands: SOUND, MUSIC and PLAY. SOUND has a range of 15Hz to 62kHz. MUSIC will play notes within a seven octave range. Up to 3 voices can be used at one time.

Mathematical Operations and Functions
The standard +, −, ×, ÷ are available as are the functions: sine, cosine, tangent and their inverses, exponential, log, absolute value, integer value, sign and square root. Full algebraic precedence is used to ensure that calculations are performed in the correct order. There are also functions to display the amount of free memory and the position of the cursor. PEEK and POKE allow direct access into memory. The boolean operators of AND, OR and NOT are available as are relational operators: =, <, >, <> (not equal) <=, >=. Machine code subroutines may be called with the USR command. User defined functions are available using DEF-FN and program data may be manipulated using DATA, READ and RESTORE. ON GOSUB and ON GOTO allow programmed jumps to a choice of locations.

All mathematical functions are accurate to 9 digits with a range of between 2.93874 × 10-39 to $1.70141 * 10^{38}$.

An Immediate mode allows the computer to be used as a calculator.

String Operations and Functions
Strings may be up to 255 characters in length. There are a number of functions to manipulate strings: ASC, CHRS, LEFTS, LEN, MIDS, RIGHTS, TAB, VAL. Strings may be concentrated (joined together) using +. Strings may be compared using =, <, >, =<, =>, <>.

Variables
Variable names may be of any length, although only the first two characters are acted upon. They may consist of combinations of the letters A-Z and numbers Ø-9. The following suffixes may be applied to variable names.

S	Indicates a string variable.
%	Indicates an integer variable (−32768 to +32767).
No Suffix	Indicates a normal floating point variable.

Arrays
Arrays may have up to 255 dimensions any may be integer, string or floating point. Arrays are named as for variables (see above).

Other Functions
A random number function RND is available. TAB, POS and SPC allow control of the cursor during printing on the screen. Eighteen different error messages are produced by the system. A complete memory mapped text editor is included for the editing of BASIC programs.

Dimensions
Height: 52mm Width: 280mm Depth: 175mm Weight: 1.1Kg

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ORIC PRODUCTS INTERNATIONAL LTD.

Coworth Park, London Road, Ascot, Berks. SL5 7SE England. For Telesales ring Ascot (0990) 27641

HOW TO ORDER YOUR ORIC-1

BY PHONE: Just ring our telesales number Ascot (0990) 27641.

BY POST: You can pay by cheque, postal order, ACCESS – BARCLAYCARD – AMEX – DINERS.

(Please allow 28 days for delivery).

Oric Products International Ltd.
Coworth Park, London Road, Ascot, Berks. SL5 7SE, England.

Item	Qty	Price Inc VAT	Total
ORIC-1 16K RAM		£99.95	
ORIC-1 48K RAM		£169.95	
ORIC Communications Modem		£79.00	
Postage and Packing			£5.95
		TOTAL £	

Name _____

Address _____

_____

_____

* Please delete/complete as applicable.

*I enclose a cheque/P.O. payable to: ORIC PRODUCTS INTERNATIONAL LIMITED for £ _____

Please charge my Access, Barclaycard, Amex, Diners Club account no.

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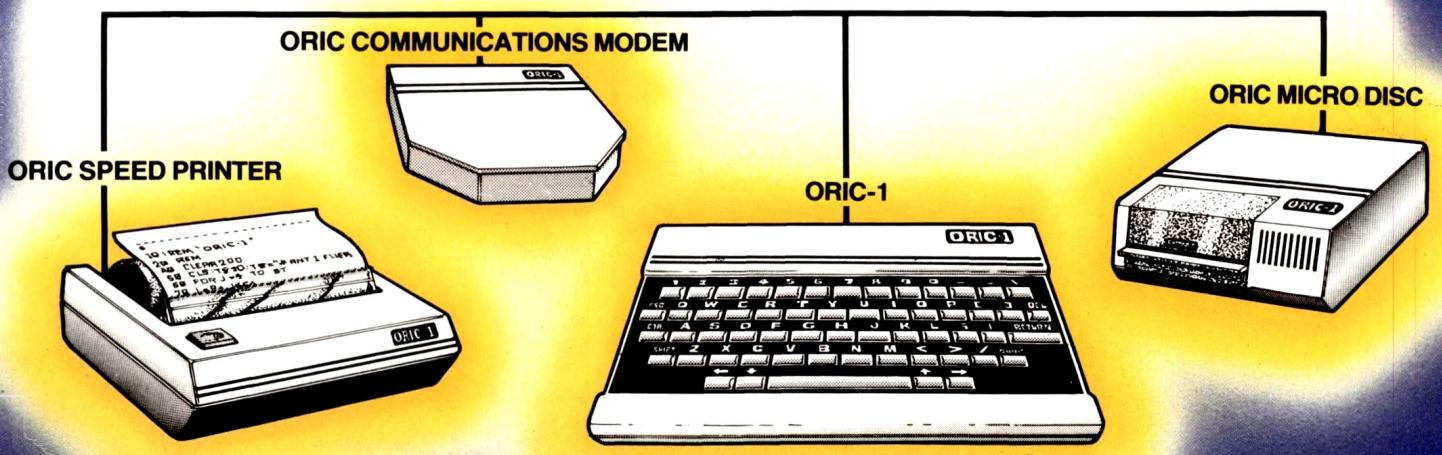
The ORIC challenge

Leading Features	ORIC-1 16K or 48K		BBC MICRO	VIC 20	TANDY TRS	SINCLAIR SPECTRUM	ACORN ATOM	APPLE II	PET	JUPITER ACE	JAPANESE IMITATIONS	METTOY DRAGON	LYNX
COLOUR	●	●											
GRAPHICS	●	●											
SOUND	●	●											
DRIVEABILITY	●	●											
MEMORY	●	●											
EXPANDABILITY	●	●											
STYLING	●	●											
DESIGN	●	●											
PEDIGREE	●	●											
VALUE FOR MONEY	●	●											

NO COMPARABLE COMPETITION

The real computer system from only £99·95 incl.V.A.T.

The ORIC system



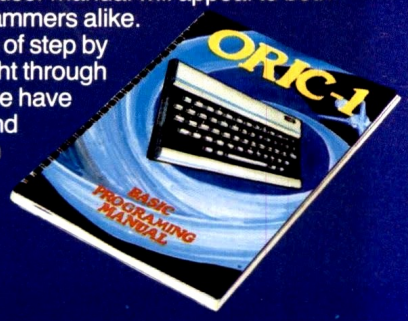
ORIC-1 – As described in this brochure, with choice of 16K or 48K RAM, complete with CENTRONICS PRINTER OUTPUT, CASSETTE PORT, UHF/RGB HI-FI OUTPUTS, POWER SUPPLY CABLE & FULL USER MANUAL.

COMMUNICATIONS MODEM – A must for modern computing. This unit, styled and designed to the ORIC quality standard, is British Telecom approved and enables the ORIC-1 user to receive and send communications via the telephone line.

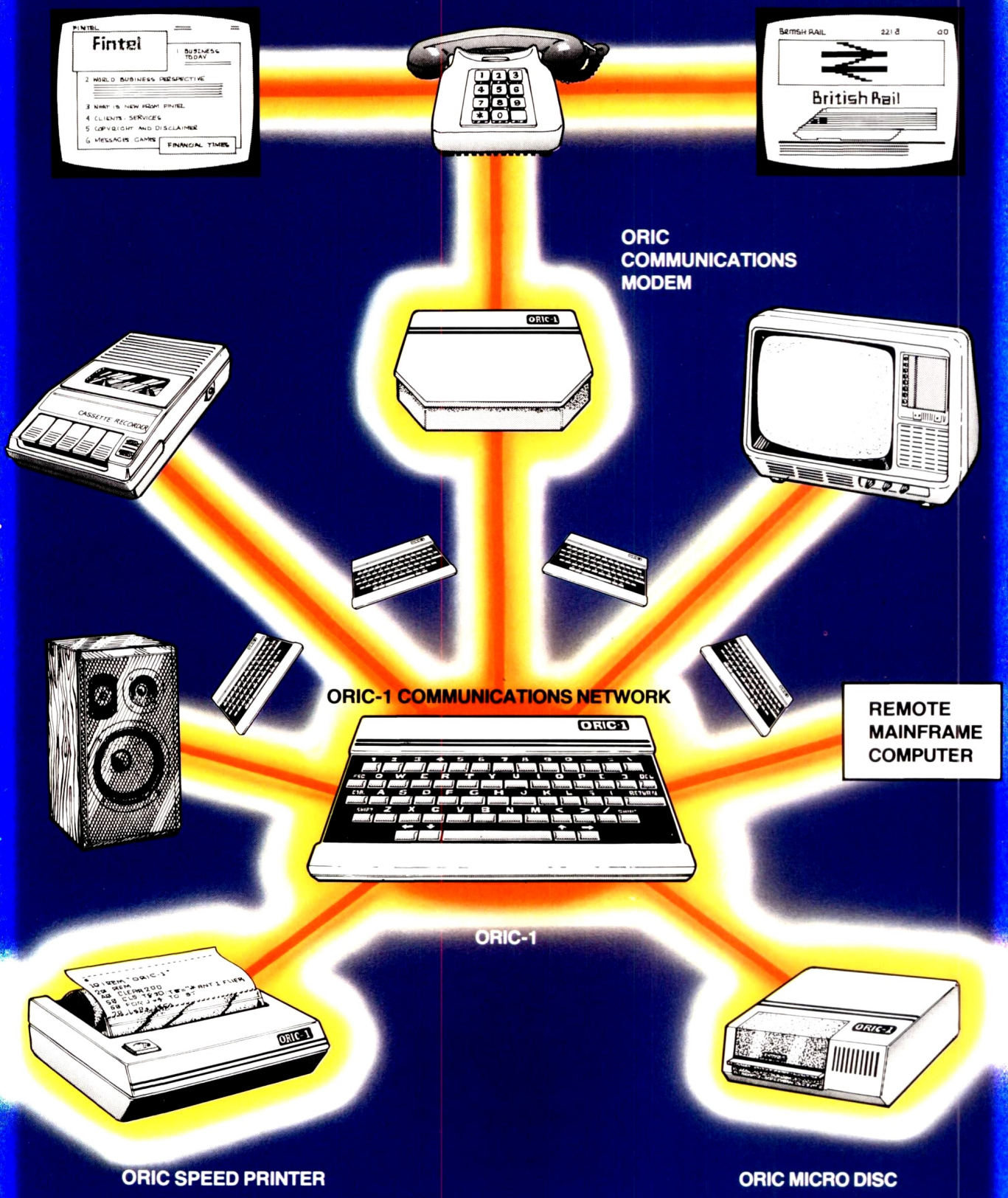
ORIC SPEED PRINTER & MICRO DISC – These units will be available to complete your ORIC system during the first half of 1983. They are designed to ensure maximum value and expandability to your ORIC SYSTEM.

ORIC USER MANUAL – FREE WITH EVERY ORIC-1 PURCHASED. Designed and written by one of the industry's leading professional authors, the ORIC user manual will appeal to both beginners and seasoned programmers alike.

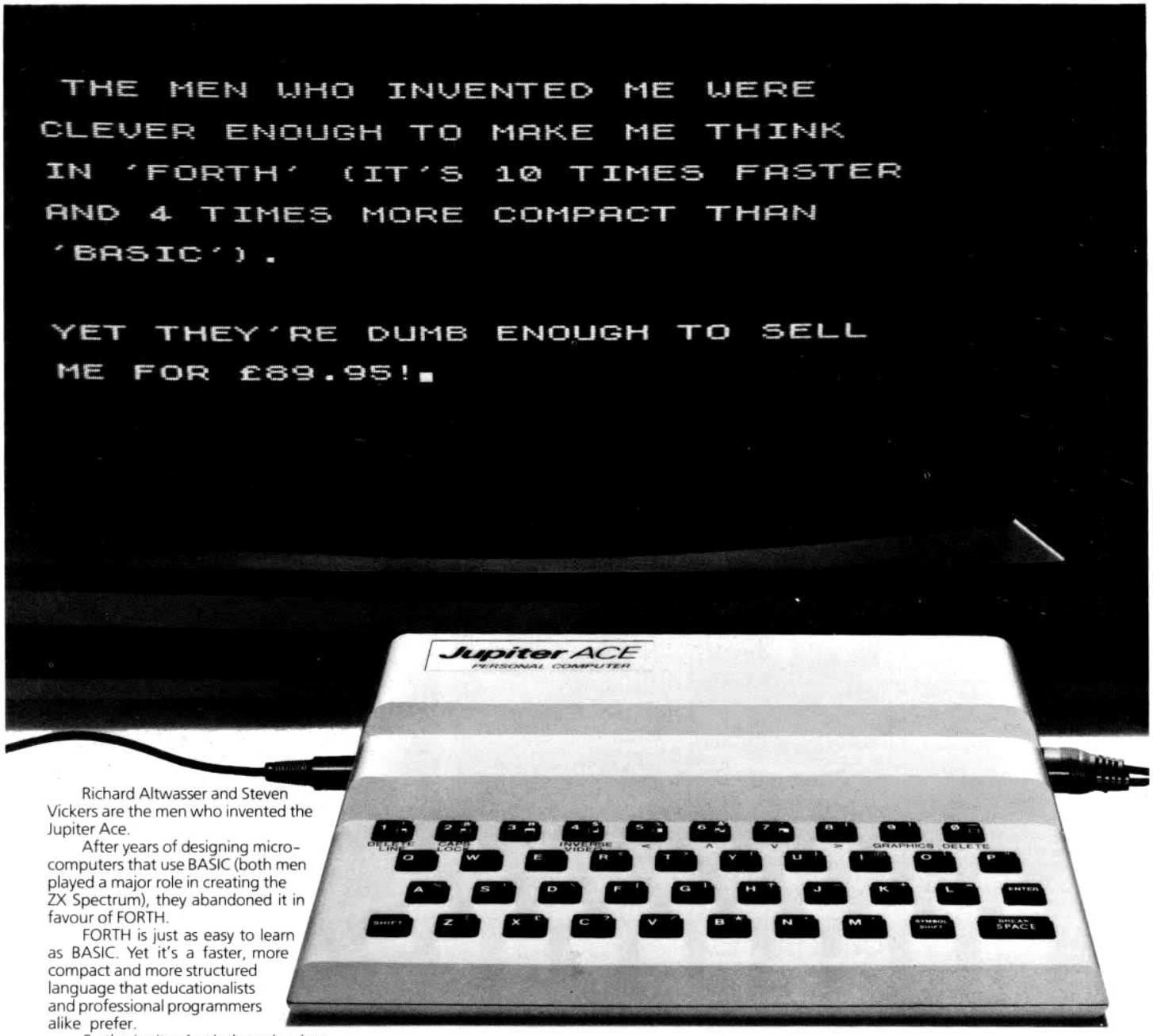
Containing over 200 pages of step by step instructions from basics right through to real computing. We believe we have produced the easiest to read, and most comprehensive instruction manual of its kind.



The real computer system



Timeless Technology from ORIC Products International Ltd.



Richard Altwasser and Steven Vickers are the men who invented the Jupiter Ace.

After years of designing micro-computers that use BASIC (both men played a major role in creating the ZX Spectrum), they abandoned it in favour of FORTH.

FORTH is just as easy to learn as BASIC. Yet it's a faster, more compact and more structured language that educationalists and professional programmers alike prefer.

So the Jupiter Ace is the only micro-computer you can buy that is designed around FORTH.

Using it, there's little fear of accidentally 'crashing' programs halfway through and having to start all over again (a common fault with BASIC). The Jupiter Ace's comprehensive error checking sees to that.

The Jupiter Ace has a full-size keyboard, high resolution graphics, sound, floating point arithmetic, a fast, reliable cassette interface, 3K of RAM and a full 12 month warranty.

You get all that for £89.95. Plus a mains adaptor, all the leads needed to connect most cassette recorders and T.V.'s, a software catalogue (35 cassettes available, soon to be 50), the Jupiter Ace manual and a free demonstration cassette of 5 programs

The Jupiter Ace manual is a complete introduction to personal computing and a simple-to-follow course in FORTH, from first principles to confident programming.

Plug-on 16K and 48K memory expansions are also available, at very competitive prices. (There'll be a plug-on printer interface available soon, too.)

It'll take you no time at all to realise how clever Richard and Steven were to design the Jupiter Ace around FORTH. And even less time to realise what a silly price £89.95 is to charge for it.

Technical Information

Hardware
Z80A; 8K ROM; 3K RAM.

Keyboard
40 moving keys; auto repeat; Caps Lock.

Screen
Memory mapped 32 col x 24 line flicker- free display upper and lower case ascii characters.

Graphics
High resolution 256 x 192 pixel user defined characters.

Sound
Internal loudspeaker may be programmed for entire audio spectrum.

Cassette
Programs and data in compact dictionary format may be saved, verified, loaded and merged. All tape files are named. Running at 1500 baud.

Expansion Port
Contains D.C. power rails and full Z80 Address, data and control signals. Can connect extra memory peripherals.

Editor
Allows complete editing and listing of compiled programs.

Please send cheque/postal order to: Jupiter Cantab, 22 Foxhollow, Bar Hill, Cambridge CB3 8EP.

Jupiter ACE

Please send me _____ Jupiter Ace microcomputers @ £89.95 (+ £3.95 p. & p.)
Tick here if you require VAT receipt ☐

Name _____

Address _____

0060183

Available for immediate delivery. Allow 14 days for p. & p. U.K. price only (export price on request).

How to increase the size of your memory.

Anyone with even a limited knowledge of home computers will instantly recognise the very large advantages of owning a Lynx.

And anyone who truly understands the considerable differences between home computers is likely to have spotted The Lynx a mile off.

With 48K of memory to start with, The Lynx far outweighs the majority of home computers on the market.

And it is precisely that size of memory which makes The Lynx a superior animal in its field.

What's more, 48K of memory is not the end of its capacity, but merely the beginning.

Your Lynx can grow. To 96K, to 128K, or to 192K. All inboard.

All of a sudden your Lynx home computer has assumed the size of memory usually associated with business machines.

Its increased capacity will mean you can have an impressive word processor.

Disk drives and printers, mono or colour monitors can be added on.

With an RS232 port, your Lynx home computer is compatible with a wide range of other manufacturers' equipment.

And CP/M® compatibility opens the door to a comprehensive selection of business software.

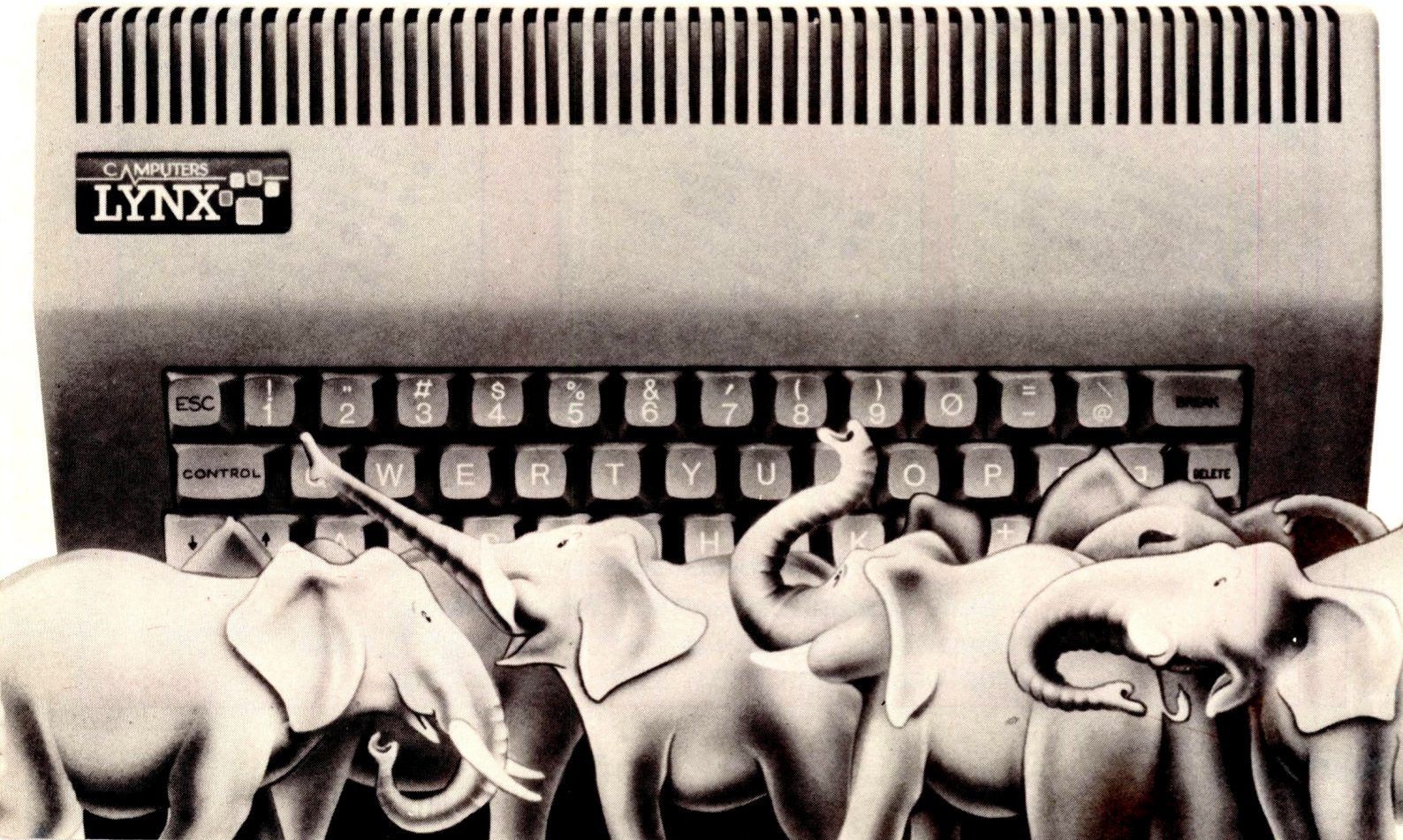
Furthermore, your Lynx home computer has high resolution colour graphics.

In other words, you are free to draw in all 8 colours anywhere on the screen.

For the full story about The Lynx home computer, call in at your nearest Laskys or Spectrum Computer Centre.

®CP/M is the registered trade mark of Digital Research Inc.

CAMPUTERS LYNX



Three out of every four computers going into schools are BBC Micros. Is there a lesson to be learned by every user?

As part of the current government subsidised scheme aimed at introducing micros to schools, the Department of Industry undertook a survey of machines available and made recommendations to education authorities all over the country.

The BBC Micro met their priorities exactly: it is economical yet fast and powerful, and it can justify the investment involved, through its capability to grow with the needs of the user and with the rapid changes in technology.

Teachers and education authorities agreed, and today it represents over three-quarters of all micros being ordered for schools across the country under the DOI scheme.

The BBC's choice too.

In choosing a machine to put their name to for their massive Computer Literacy Project, the BBC had the same set of priorities as the DOI. The BBC Micro is now an integral part of that project, which includes books, software, courses and a number of major television series, one of which, "Making the Most of the Micro" is now being broadcast.

All this for only £399.

The BBC Micro is light and compact. It generates high resolution colour graphics, and is capable of synthesising music and speech using its own internal speaker. The keyboard uses a conventional layout and typewriter feel.

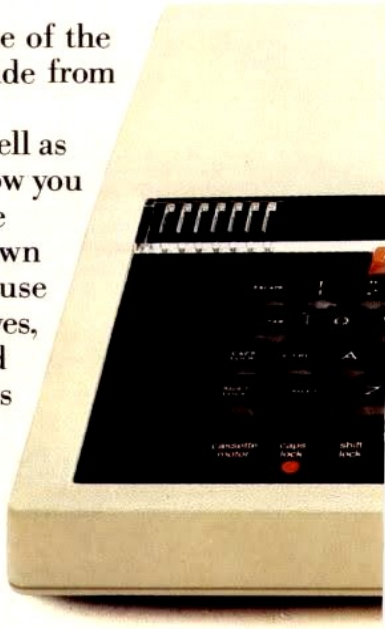
The most sophisticated version (called Model B) is available for only £399. (There is also a basic model available, the Model A, at £299.)

Designed to grow.

Last year the magazine "Which Micro?" said that the most attractive and exciting feature of the BBC Microcomputer was its 'enormous potential for expansion'.

This is indeed one of the features that sets it aside from the competition.

For example, as well as interface sockets to allow you to connect to a cassette recorder, and to your own television, you can also use video monitors, disc drives, printers (dot matrix and daisy wheel) and paddles for games or laboratory use.



You can also plug in ROM cartridges containing games with specialist application programs.

The Tube. A unique feature.

The Tube, which is unique to the BBC Micro, provides for the addition of a second processor via a high speed data channel. The possibilities are enormous. For example, the addition of a second

3MHz 6502 processor with 64K of RAM doubles processing speed. While a Z80 with 64K of RAM opens the door to a fully CP/M* compatible operating system, with all the benefits for business applications.

Linking up with other computers.

The BBC Micro also offers a facility of immense potential value to schools, colleges and businesses. It's called Econet® – a system which uses telephone cable to link with other BBC Micros. A number of machines can then share the use of expensive disc drive and printer facilities.

Make full use of Prestel & Teletext.

With special adaptors you will not only be able to turn your TV set into a Prestel terminal and Teletext receiver, but you can also take data and programs direct from these services. (The programs, which are known as telesoftware, are already being broadcast by BBC's Ceefax service.) This is another first for the BBC Micro.

BASIC plus.

A sophisticated version of BASIC has been chosen for the BBC Micro, which incorporates features normally found only in more advanced high level languages. However, there is also a facility allowing access through a simple command to another language – for example, PASCAL, FORTH and LISP.

*Trademark of Digital Research.

A full range of software.

Applications software for the BBC Micro already cover a very wide field. Packages covering games, education and business applications are available on cassette. All developed to the same high standards set by the hardware.

The best possible back-up.

Your BBC Micro comes with the backing of the BBC and an extensive dealer and service network.

Each approved dealer is able to offer advice and carry out expansion work and repairs.

BBC Microcomputer – Model A and Model B.
2MHz 6502A Processor.
32K ROM; 16K RAM Model A, 32K RAM Model B.
Full QWERTY keyboard with 10 user-definable function keys.
Mixed high resolution graphics and upper and lower case text.
300 baud and 1200 baud interface for standard cassette recorders.
Three-voice music synthesis with full envelope control feeding internal loudspeaker.
Interface sockets (Model B only) – RS423, for analog inputs centronics and user port.
6502, Z80, 16032 second processors.
Single and Dual Disc Drives with 100 and 800 K-bytes storage.
Teletext unit.
Speech synthesis.
Networking facility – via Acorn Econet®

How to buy your BBC Micro.

If you are a credit card holder and would like to buy a BBC Micro B, or if you would like the address of your nearest stockist, just phone 01-200 0200.

Alternatively, you can buy a Model B directly by sending off the order form below to: BBC Microcomputers, c/o Vector Marketing, Denington Estate, Wellingborough, Northants, NN8 2RL.

All orders are despatched by fully insured courier and come complete with easy to follow 500 page User Guide and Welcome cassette.

☎ 01-200 0200 credit card holders.

To BBC Microcomputers, c/o Vector Marketing, Denington Estate, Wellingborough, Northants NN8 2RL.

Please send me _____ BBC Model B Microcomputers at £399 each, inc. VAT and delivery. I enclose PO/cheque payable to Acorn Computers Limited Readers A/C or charge my credit card.

Card Number _____
Amex/Diners/Visa/Access (Delete)

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Registered No. 140 3810 VAT No. 215 400220

The BBC Microcomputer System.

Designed, produced and distributed by Acorn Computers Limited.

Micro-Professor

THE 64K COMPUTER THAT SPANS GENERATIONS.

The complete 'family' micro-computer...

The **Micro Professor** is truly a family computer. With its powerful **64K RAM** and **16K ROM**(including 12K bytes for BASIC) it can handle the needs from the children to the office environment. Since the **Micro Professor** runs most of the existing APPLE II Software you will never be at a loss for home management and entertainment programmes. You and your family will also want to explore the emerging worlds of computer music, art, design and animation.

The Micro Professor can do all this and more.

In business, the **Micro Professor** can be a valuable tool at work with its capability to handle APPLE II Software you have access to a wide range of programmes such as accounting, payroll, job costing and inventory control, or if you have a special problem unique to your business you can write your own programmes in BASIC or go to high level languages such as PASCAL, FORTH, LOGO and PILOT.

Micro-Professor Peripherals:

- **55 Key, full-size keyboard with single stroke BASIC commands.**
- **Floppy Disc drive.**
- **Thermal or dot matrix printer.**
- **Joystick controls.**

16K ROM(includes 12K of BASIC)makes it easy.

The kids will love the excellent range of games available, 120 at present and growing all the time, plus with the knowledge that the **Micro Professor** is capable of handling APPLE II Software they can possibly relate to the APPLE II computer they are using at school. With its six colours plus high and low resolution graphics the **Micro Professor** will sustain the most enquiring mind to explore the world of computer aided design.

AVAILABLE THROUGH YOUR LOCAL spectrum COMPUTER STORE.

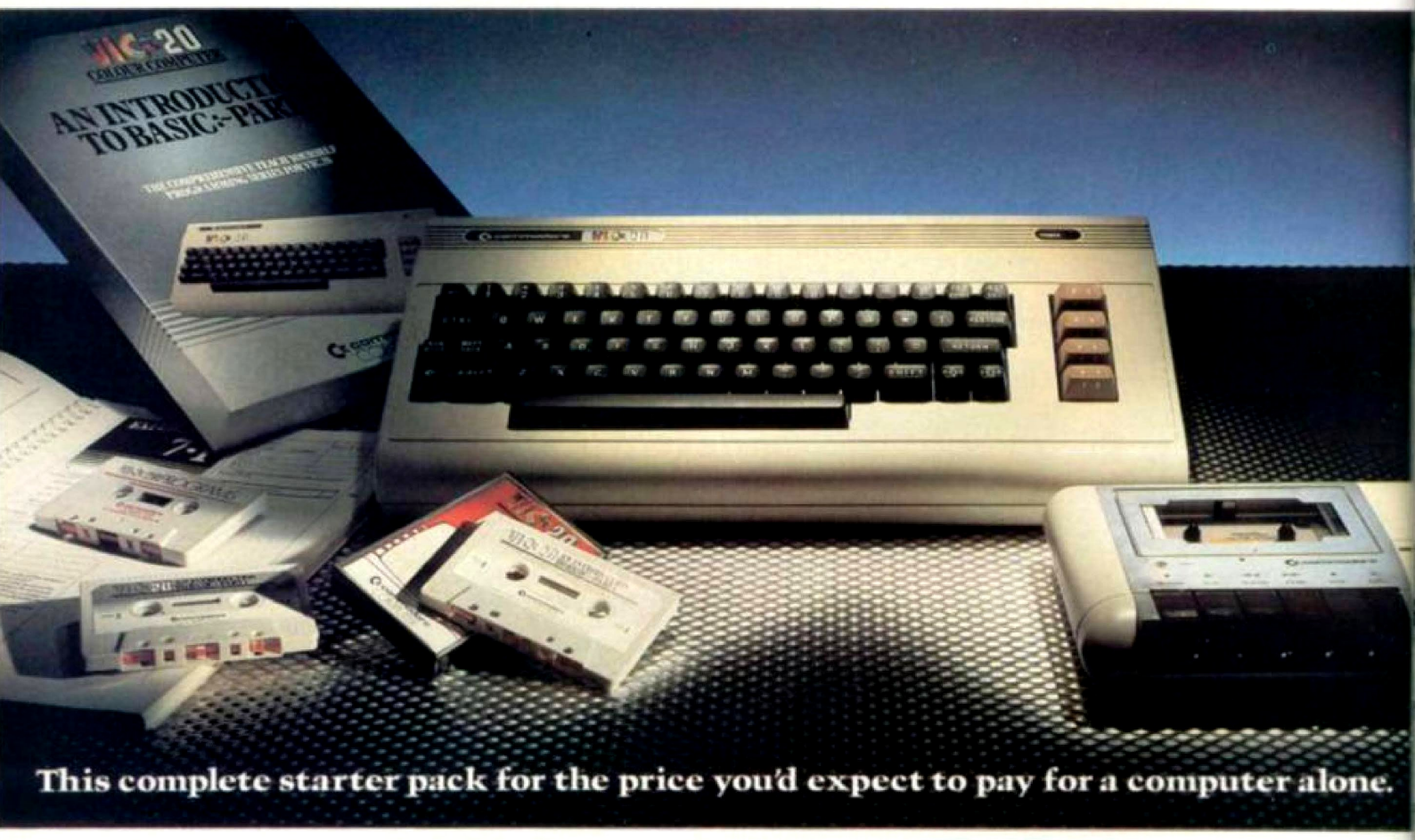
Micro-Professor

Apple II is a trademark of Apple Computer Inc.

MPF II MASSIVE FOR A MICRO.

Exclusive U.K. Importers:
SIRTEL [UK] LTD., 19/24 Alfric Square, Off Maxwell Road, Woodston Industrial Estate, Peterborough PE2 0JP. Tel:(0733) 236010/233955

Your starter for £150.



This complete starter pack for the price you'd expect to pay for a computer alone.

It's a complete computer system: the Commodore VIC 20 computer, a cassette unit, a simple explanation of computer programming (called "Introduction to Basic Part 1"), plus an exclusive compilation tape of four computer programs (Blitz, Type-a-Tune, Race, and Hoppit).

And all for just £149.99 or less.

It's a terrific opportunity to introduce yourself, and all your family, to the exciting world of home computers – and with what has been described as the best home computer in the world.

The VIC 20 has educational programs for all ages (spelling, physics, arithmetic, etc.), plus music, typing, chess and home accounts. There are special programs like Robert Carrier's menu planner and BBC 'Mastermind', and not forgetting, of course, lots and lots of wonderful arcade games.

You'll very soon be exploring new worlds of colour, animation, and sound. Not just with a vast choice of programs, but with unlimited scope for expansion in the future.

The VIC 20 is the perfect computer to start with because you can keep adding to it, and so get even more enjoyment out of it.

There are printers, disk drives, memory expansion packs and many other peripherals to choose from.

Which means, as your confidence grows, so can your VIC 20.

Get the VIC 20 starter pack today, and we promise you'll never look back.

commodore

VIC 20

The best home computer in the world.

YOU CAN SEE THE VIC 20 STARTER PACK AT ALL BRANCHES OF DIXONS AND WALLACE HEATON, AND AT SELECTED BRANCHES OF BOOTS, RUMBELOWS, LASKYS, CURRYS, GREENS, ORBIT, RANK XEROX, MENZIES, LEWIS'S, ASDA, TESCO, FINE FARE, WIGFALLS, SPECTRUM, COMET, JOHN LEWIS, WOOLWORTH, REDIFFUSION, CO-OP AND OTHER GOOD RETAILERS. ALSO AT BRANCHES OF A NATIONAL NETWORK OF COMMODORE COMPUTER DEALERS.

AT LAST, A HOME COMPUTER THAT IMPROVES WITH AGE.

It's surprising how many first-time relationships with a home computer go sour with age.

You buy an attractive, discounted little machine so that you and the children can learn about computers.

Instead, you learn about its limitations: the dull graphics. The plugs that fall out. The cheap power supply. The unalterable "beginners" language. The stiff, fragile keys. No provision for future developments. If only you'd looked around a bit in the beginning... *"Quality costs a little more, but it's usually worth paying for"* (Personal Computer News – CGL M5 Review, June '83.)

The CGL M5 is designed and built by Sord, one of Japan's leading computer specialists, with three main ideas in mind.

First, to be easy and fun to learn and operate.

Second, to be rugged enough to last through hours and hours of operation.

And third, to form the basis of a powerful, versatile home computer system that won't need replacing until you're ready for a dedicated business system.

Built to learn

The CGL M5 is designed to be easy for non-geniuses to use.

"On the M5, most of the work is done for you, and all that is left is the need to work out what to do next, rather than how to do it." (Personal Computer News, June '83.)

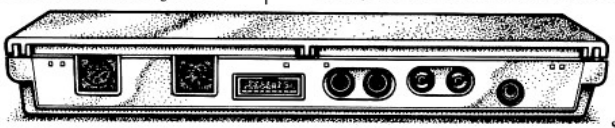
If you make a mistake, you can correct it with a simple movement of the cursor. So you only correct that mistake, not a whole line; nor do you have to indulge in complex edit commands.

Budding video game designers and computer artists will love to get their hands on the 16 colour graphics and 32 moveable images called "sprites."

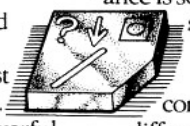
"The M5 makes professional graphic effects very simple for even the beginner to achieve." (Personal Computer World, Aug. '83.)

Built to last

"It works first time, doesn't need a lot of mollycoddling and jiggery-pokery to persuade it to continue to do so, and what's even better, it continues to work well. You don't have to balance cold cartons of milk on the top, shove matches in the back to keep the plugs in, or press the keys with several pounds force to make them respond." (Personal Computer News, June '83.)



Being able to build things that work and carry on working without endless maintenance is something at which the Japanese seem to excel.



Built to grow

To be truly versatile, a home computer has to understand very different things.

So you need different "languages," which the M5 provides by supplying part of its memory in plug-in cartridges.

"The M5 eliminates the worst limitations on machines at this level, which is that they tend to be stuck with whatever language is provided by the management." (Personal Computer News, June '83.)

The computer is supplied complete with a Basic-I cartridge, a standard integer BASIC language and a simple learning text.

Plug in the Basic-G cartridge, and you can access the M5's incredibly sophisticated graphic and sound capabilities which are far in advance of similarly-priced computers.

Move on to the Basic-F cartridge, and you have scientific, technological and statistical computing power usually available only on big computers with equally big price tags.

The FALC cartridge provides a tailor-made language for data management, spreadsheet accounts and business problems. Combine FALC with a disc and you could *"turn the M5 into a small business machine"*. (Personal Computer Magazine, August '83.)

Now, take a look at the back of the M5. Notice the sockets (usually an extra) for a standard Centronics-type printer, the separate video monitor and hi-fi sound output.

Even the language cartridge socket has hidden potential:

"Unlike most such sockets, this one has 56 internal lines connected to it giving access to just about every function in the computer. This means that just about everything you can think of can be added onto the computer, ranging from a Prestel interface to second processor to use as an intelligent terminal on a timesharing computer"... (Electronics – The Maplin Magazine, March '83.)

Take a look at the home computer that will improve with age.

For a full technical specification of the CGL M5, details of the wide range of supporting software and to find out where to see a complete demonstration, send the coupon to: CGL, CGL House, Goldings Hill, Loughton, Essex IG10 2RR. Telephone number: 01-508 5600.

I'd like to know more about the CGL M5. Please send me a brochure and a list of dealers.

PCW/1

Name_____

Address_____

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CGL M5 HOME COMPUTER

BUILT TO LEARN. BUILT TO LAST. BUILT TO GROW.

Why you'll feel more at home with our computers.

Before we designed our computers, we thought about who was going to use them.

One day, our computers might be playing games; next, they're wrestling with household budgets; teaching geography to an 8-year-old; or printing 2,000 letters.

In other words, we designed our computers and software for as many applications as a family has ideas.

(Now the ATARI 800 has 48K RAM, there's even more memory for even more applications.)

Next, we built in high-resolution graphics. Inside our computers, we have a microprocessor whose only job is to operate our graphics.

(All told, you can choose up to 16 different colours from a spectrum of 256 different shades.)

In fact, Atari computers divide the screen up into 60,000 tiny points, each one of which can be changed without affecting the other.

On screen, you can even blow up a line of type to quad size (invaluable if you're teaching a child to read).

We also looked at ways to make computers rather friendlier.

On the ATARI 400, we've incorporated touch-sensitive keys with ridges, so fingers won't slip; on the ATARI 800, we have keys much as you'd find on a standard typewriter.

You talk to your computer in a choice of languages, including ATARI BASIC, using software which you load in on cartridge, cassette, or disk.

At Atari, we have one of the largest software libraries in the world (some of our current titles are on display on this page).

No doubt you know all about our games, but we also boast home and office application software as well as educational programs to satisfy the most enquiring mind.

At the same time, through Atari's Program Exchange (APX), you can have access to a wide range of the most imaginative programs written by our users.

Or you can learn to write your own programs with the help of our 'Invitation to Programming'™ series, using our unique 'sound through' system.

Surprisingly, you won't have to plough through a small library of manuals to do so, since most of the series is on software, not in hard books. Of course, we've always had just about everything you're looking for in computers.

From today, we've got even more.

ATARI®

Home computers you'll feel at home with.

™are trademarks of Atari Inc.® ATARI and design. Reg. in UK.

The Atari Library.
One of the finest software libraries in the world.

The APX Library.
A wide range of titles written by users.

More K's.

ATARI 800.™ No price increase. Upgraded from 16K to 48K RAM.

Less £'s.

ATARI 400.™ Reduced from £199.99 (S.R.P. inc. VAT) to £159.99.

At prices like these, they must be worth a closer look.

Here's a closer look.

From today, we've upgraded the ATARI 800 to 48K, but we haven't upped the price by a penny. It's still £399.99.

As for the ATARI 400 it's reduced by around £40. Now take a closer look.

ATARI 800 and ATARI 400. The straight facts.

Computer console: FCC approved, with built-in RF modulator. Connects to any standard colour or black & white TV.

Colour: Choose from 16 colours, and 16 intensities.

Sound: Four independent sound synthesisers for musical tones or game sounds. Four octaves. Variable volume and tone for each channel.

Display: Three text modes: 24 lines of 40 characters; double-width characters. Nine graphic modes: from 40 columns by 24 rows up to 320 columns by 192 rows.

Keyboard: 57 alphanumeric keys plus 4 special function keys. Inverse video. Upper/lower case.

Full screen editing. Four-way cursor control. 29 graphics keys. Full stroke keyboard (ATARI 800) and mono panel keyboard (ATARI 400) for fast, easy data entry and interaction with the computer.

I/O: Serial input/output port for simple connection to peripherals. Four controller jacks for joystick and paddle controllers.

Memory: Includes a built-in 10K Read Only Memory (ROM) Operating System with 48K Random Access Memory (ATARI 800) and 16K Random Access Memory (ATARI 400). ROM may be expanded with user-installed cartridge programs.

CPU: 6502B Microprocessor. 0.56 microsecond cycle. 1.8MHz.

Language: Atari BASIC Cartridge is included with ATARI 800. Also programmable in Atari Microsoft BASIC, PILOT, PASCAL, extended Fig. Forth and assembly language.

Monitor: With the ATARI 800, if desired, a monitor jack allows composite video output for connection to a colour or black and white monitor (in addition to a standard television set).

Owner's guide: Atari BASIC Self-Teaching Guide and Atari BASIC Reference Manual included with ATARI 800.

Extended graphics functions: Hi-resolution graphics. Multi-coloured character set. Software screen switching. Mixed text and graphics modes.

Multiple redefined character sets. Player missile (sprite) graphics. Fine screen scrolling in any direction. Changeable colour registers. Smooth character movement.

Software: Self-teaching programs with the unique voice-over. Home Management. Education. Programming aids.

And of course Atari's famous entertainment software.

Peripherals: A complete range of peripherals and accessories that are available now.

Although the NewBrain is conceived as a total system, the unexpanded Processor itself has a great deal to offer. It is available in two forms: Model AD, shown below, with a built-in line display; and Model A, without the line display. Both models can operate with a monitor or a television set.

MEMORY

- 24K bytes of ROM;
- 32 bytes of RAM, at least 28K of which is available to the user.

THE SCREEN DISPLAY

- 40 or 80 characters to the line – without affecting the 28K bytes of RAM at your disposal;
- 24 or 30 lines to the screen;
- well-formed characters, with true descenders;
- a full European character set;
- normal or reverse video, high resolution graphics on screen of controllable size, 256, 320, 512 or 640 horizontal resolution by 250 vertical lines;
- a facility to set up a "page" of up to 255 lines, with the screen acting as a "window" to display it;
- ability to maintain several such pages simultaneously, and to switch rapidly between them;
- text may be used on graphics screen as well as on parts of the video screen not used by graphics.

CHARACTER SET

- 512 characters, including the full ASCII set, all European accented characters, Greek and graphics symbols.

GRAPHICS

- 20 powerful graphics commands;
- all text characters usable on the graphics screen;
- variable-sized graphics screen, with the rest of the screen available for text – for versatility and to save memory.

SOFTWARE

Enhanced ANSI BASIC; screen editor (32 commands); mathematics package (10 significant figures); graphics commands.

- a very friendly screen editor – a delight to use and readily adapted to text processing;
- arithmetic to 10 significant figures;
- very controllable output formatting of numbers – invaluable for accounting, statistics, and scientific applications;
- a powerful, much enhanced BASIC;
- a very flexible operating system, which allows any data stream to be opened to any device.

INTERFACES

- two tape cassette ports built into the processor unit;
- a built-in printer interface;
- a built-in communications interface (V24/RS232);
- a video monitor interface;
- a TV interface;
- an expansion interface for NewBrain system expansion modules.

KEYBOARD

- standard typewriter pitch, action, layout and size, with editing control and graphics keys.

*CP/M IS A REGISTERED TRADE MARK OF DIGITAL RESEARCH INC.

You can get everything in the box on the

If you understand the facts and figures on the left you'll soon realise that NewBrain has to be one of the most powerful micros around.

However, if you find the box on the left a little hard to follow, don't worry.

We've got over 120 dealers nationwide who've got all the answers at their fingertips.

Either way you'll discover that NewBrain is the kind of micro that will stop the competition getting a look in.

At £269 it starts off with twice as much memory as most of its competitors and can expand to over thirty times that amount. So there's no chance of being left behind in the micro race.

It comes with a very powerful language (enhanced ANSI BASIC) and it'll take CP/M,* so it'll work on the same system as similar big business micros, giving you the capacity to use an almost limitless variety of tried and tested software.

But most of all NewBrain is a machine that can expand.

It's designed to take disks, printers and memory expansion modules (up to 2M bytes) plus anything else you'd expect a professional business micro to handle.

So, whether you understand the box on the left or not, pay a visit to someone in the know on the right.

They'll answer all your questions and give you a full demonstration.

NewBrain

Grundy Business Systems Ltd., Grundy House, Somerset Road, Teddington.

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Sinclair ZX Spect

The growing range of Spectrum Software

You'll know already that the Spectrum has generated an enormous range of peripherals and independent software. Our own range is growing very fast and is shown in the Sinclair Software Catalogue – *free* with every ZX Spectrum.

rum-news!

16K now £99·95

Previously £125.

48K now £129·95

Previously £175.

ZX Printer now £39.95

Previously £59.95

How to order your ZX Spectrum
Access, Barclaycard or Trustcard holders – call 01-200 0200 24 hours a day, every day. By FREEPOST – use the coupon below. Please allow up to 28 days for delivery. 14-day money-back option.

At last, a 16K colour computer with graphics for under £100!

Why have we done it?

Partly because the sheer volume of Spectrums sold (over 300,000 so far) has brought down unit production costs.

And partly, of course, because we hope you'll buy a Sinclair computer – and not some competitor's promise! We've all heard about colour computers breaking the £100 barrier. Here's the computer that's done it. A colour computer with advanced graphics that's fully supported, and widely available.

Right now, you can order a Sinclair Spectrum at these prices direct from Sinclair on the order form below. And to make it even easier to handle high-level computing at the lowest possible price, we've cut the cost of the printer, too. At £39.95, it's almost unbelievable!

At prices like these, there's really no reason to wait.

sinclair ZX Spectrum

Sinclair Research Ltd., Stanhope Road, Camberley, Surrey, GU15 3PS.
Tel: 0276 685311. Reg. no: 1135105.

To: Sinclair Research, FREEPOST, Camberley, Surrey, GU15 3BR. **Order**

Qty	Item	Code	Item Price £	Total £
	Sinclair ZX Spectrum – 16K RAM version	3000	99.95	
	Sinclair ZX Spectrum – 48K RAM version	3002	129.95	
	Sinclair ZX Printer	1014	39.95	
	Printer paper (pack of 5 rolls)	1008	11.95	
	Postage and packing: orders under £90	0028	2.95	
	orders over £90	0029	4.95	
			Total £	

Please tick if you require a VAT receipt

*I enclose a cheque/postal order payable to Sinclair Research Ltd for £

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Name: Mr/Mrs/Miss

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PCW 906

FREEPOST – no stamp needed. **Prices apply to UK only.** **Export prices on application.**

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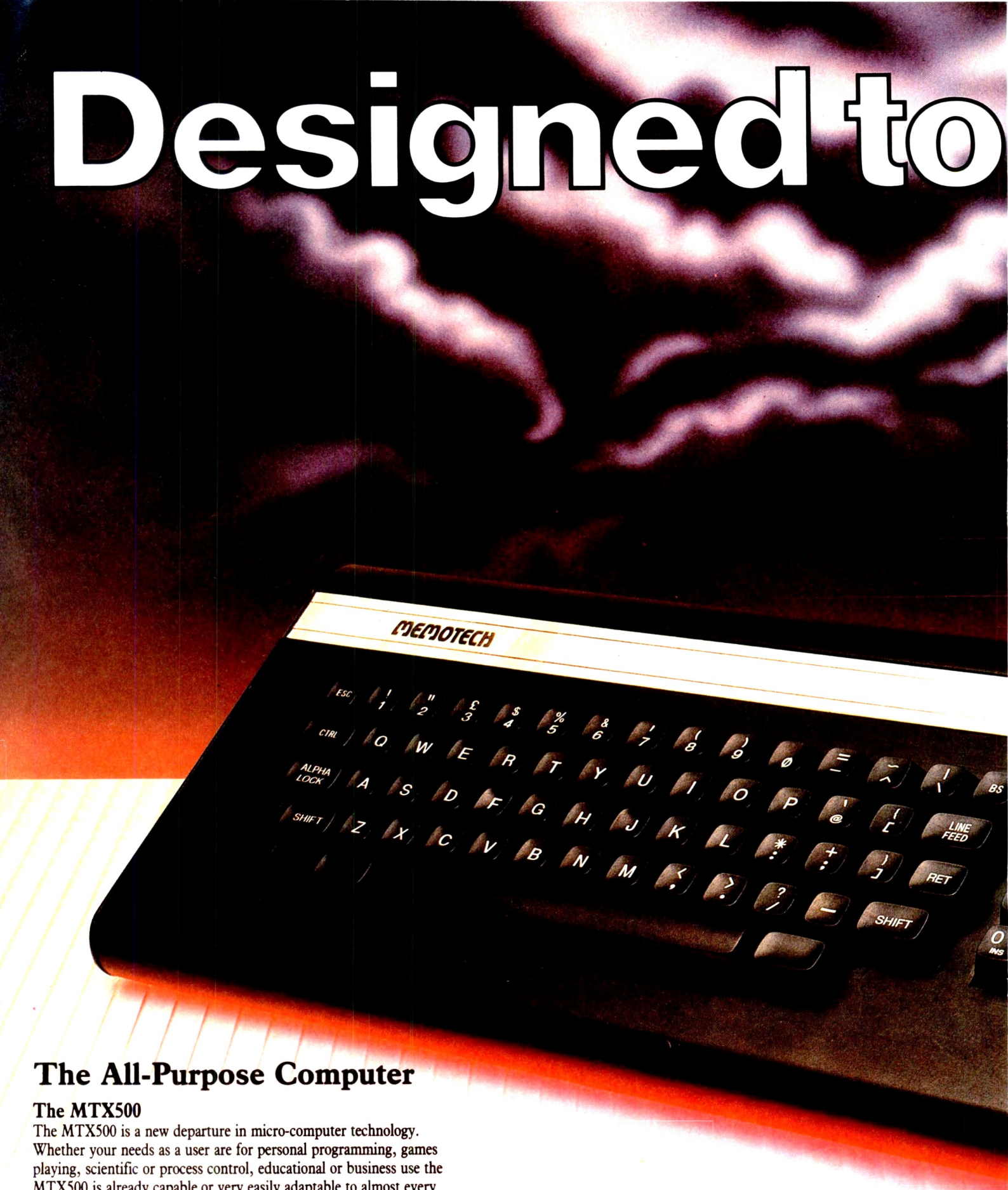


The All-Purpose Computer

The MTX500

The MTX500 is a new departure in micro-computer technology. Whether your needs as a user are for personal programming, games playing, scientific or process control, educational or business use the MTX500 is already capable or very easily adaptable to almost every application. Glance through the standard features below – you'll see what we mean.

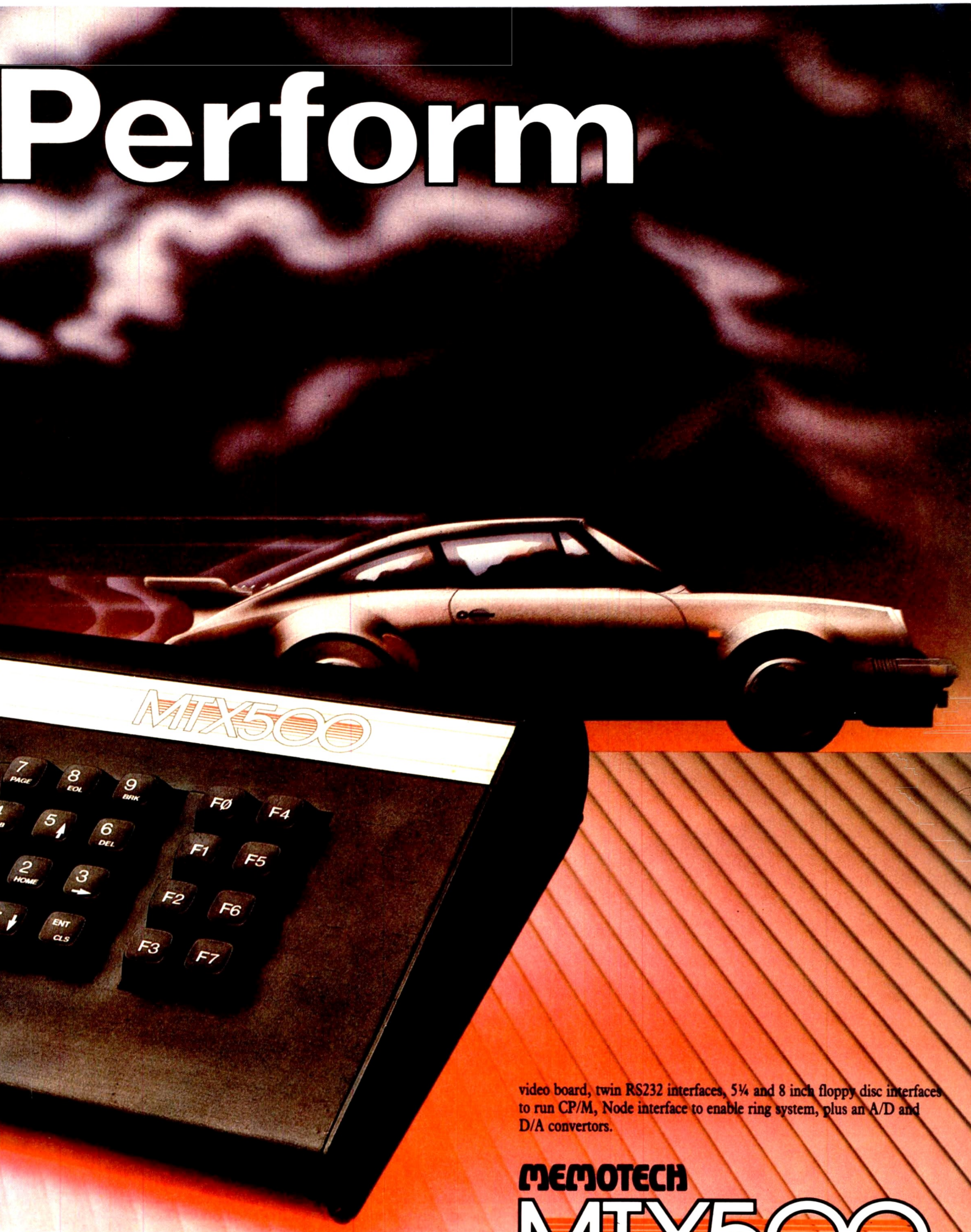
Software

The MTX500's 16k ROM contains several languages and routines which enable the novice or the experienced programmer to make full use of the machine. Standard languages are MTX BASIC, LOGO and NODDY. ROM routines include an ASSEMBLER/DISASSEMBLER with screen display of the Z80 CPU registers, memory and program which can be manipulated from the keyboard. Machine code programs can be stepped through one instruction at a time, and easily called from within BASIC programs. A further feature is the Virtual Screen facility which enables the programmer to define sections of the screen to work independently whilst maintaining all full screen facilities. Pascal is available as an add-on ROM pack.

Hardware

As standard – 32k of user RAM expandable to 512k plus 16k of dedicated video RAM. Sixteen colours, 40 column text, 256 × 192 high resolution graphics with all sixteen colours available and easily moveable user defined graphics (Sprites) combine to make effective screen displays quick and simple to achieve. Standard outputs are centronics printer

Perform



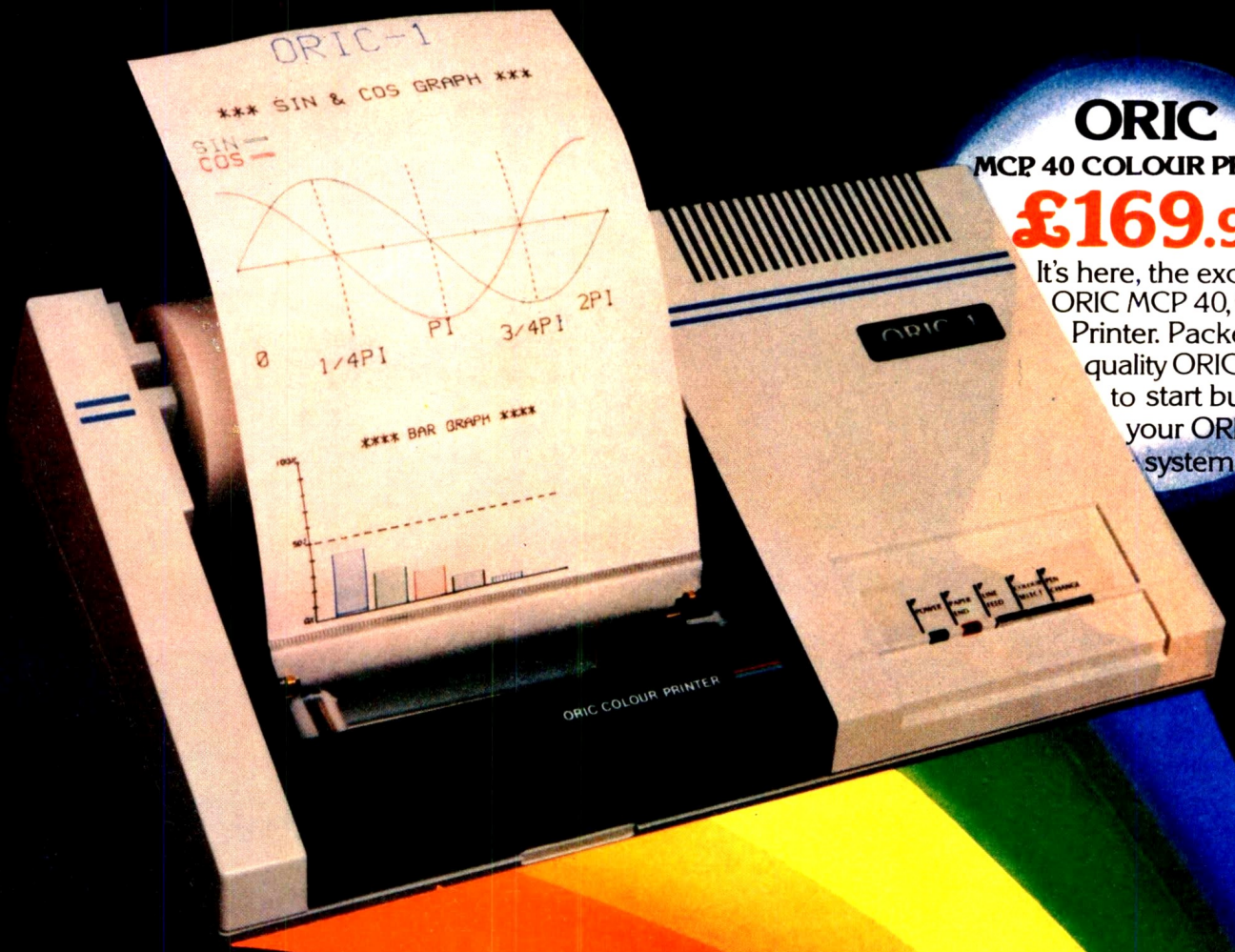
port, two joystick ports, an uncommitted I/O port, 2400 Baud Cassette port, separate TV and Video Monitor ports, 3 voice sound with hifi output plus a dedicated games cartridge port. Other standard features include the Z80A processor running at 4MHz, real time clock, full moving key keyboard with 79 keys including eight function keys and separate numeric pad. Optional expansions include 80 column colour video board, twin RS232 interfaces, 5¼ and 8 inch floppy disc interfaces to run CP/M, Node interface to enable ring system, plus an A/D and D/A convertors.

MEMOTECH

MTX500

For further information, please write to:
Sales Dept. Memotech Limited, Station Lane Industrial Estate, Witney, Oxon. OX8 6BX. Telephone Witney (0993) 2977.

ORIC MCP 40 COLOUR PRINTER



ORIC
MCP 40 COLOUR PRINTER
£169.95 incl.V.A.T.

It's here, the exciting new ORIC MCP 40, Colour-Printer. Packed with quality ORIC features to start building your ORIC system.

Superbly styled and quality engineered to provide 4 colour hard copy, for home and business use.

Just look at these leading features:

- **Quality hard copy on plain paper**
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- **Prints 4 colours – Red, Green, Blue and Black**
- **Designed to match the futuristic style of ORIC 1**
- **Plugs straight into your ORIC – printer lead supplied**

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The ORIC MCP 40 – Setting new standards in Micro Computer Printers. ORIC The Real Computer System

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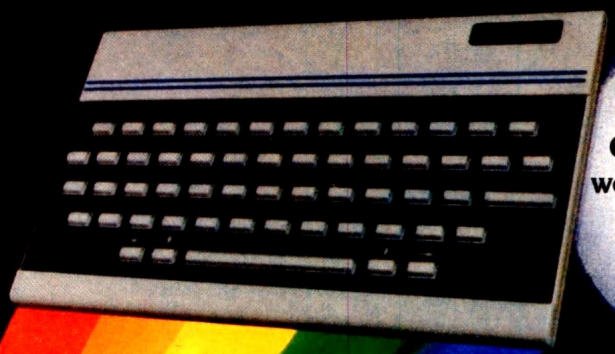

ORIC-1 16K
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ORIC 1 16K & 48K Micros

- Superb Styling
- Ergonomic keyboard with 57 moving keys
- 28 rows x 40 characters high resolution
- Teletext/Viewdata compatible graphics
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- Centronics printer interface and cassette port
- Free user manual, cassette recorder lead and Driver game included.

ORIC 1 Todays best value in real computer systems.

To be launched within the next few weeks - the revolutionary ORIC 3" MICRO FLOPPY DISK DRIVES, with incredible access time and data storage capacity.

Other peripherals to be launched this year...

It is Oric's policy to continue to expand our product range, in order to offer our customers a comprehensive, professional, Micro Computer system, at a realistic price.

We believe that with the launch of our MCP 40 colour printer, and our combined computer/software value packs, we will continue to lead the small micro market in both quality and value.

*Titles may vary subject to availability but the approximate value will not.

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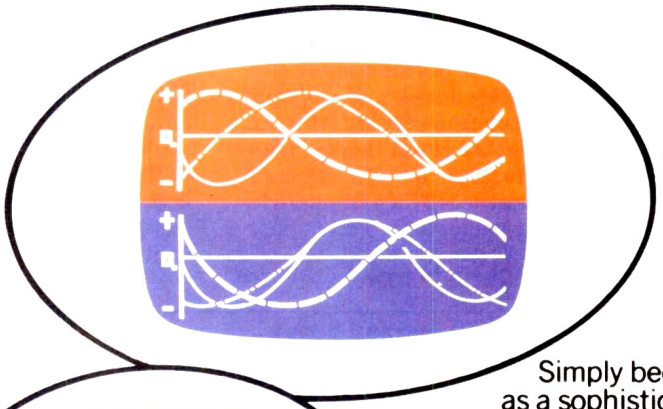
For those that do,



The do's and don'ts of the new CGL M5 home computer reveal why it is such a remarkable family computer. Unrivalled in its range.

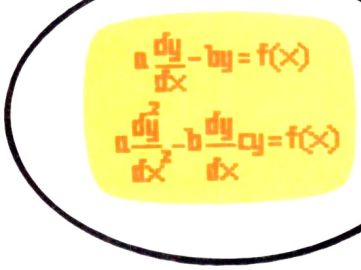
For those family members that do revel in creating their own personal computer programmes the M5 will test all their abilities. And teach them many more.

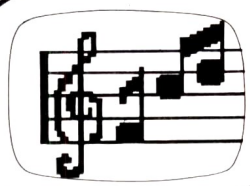
Alternatively for those that don't want to become so involved in programming the M5 couldn't be more fun.

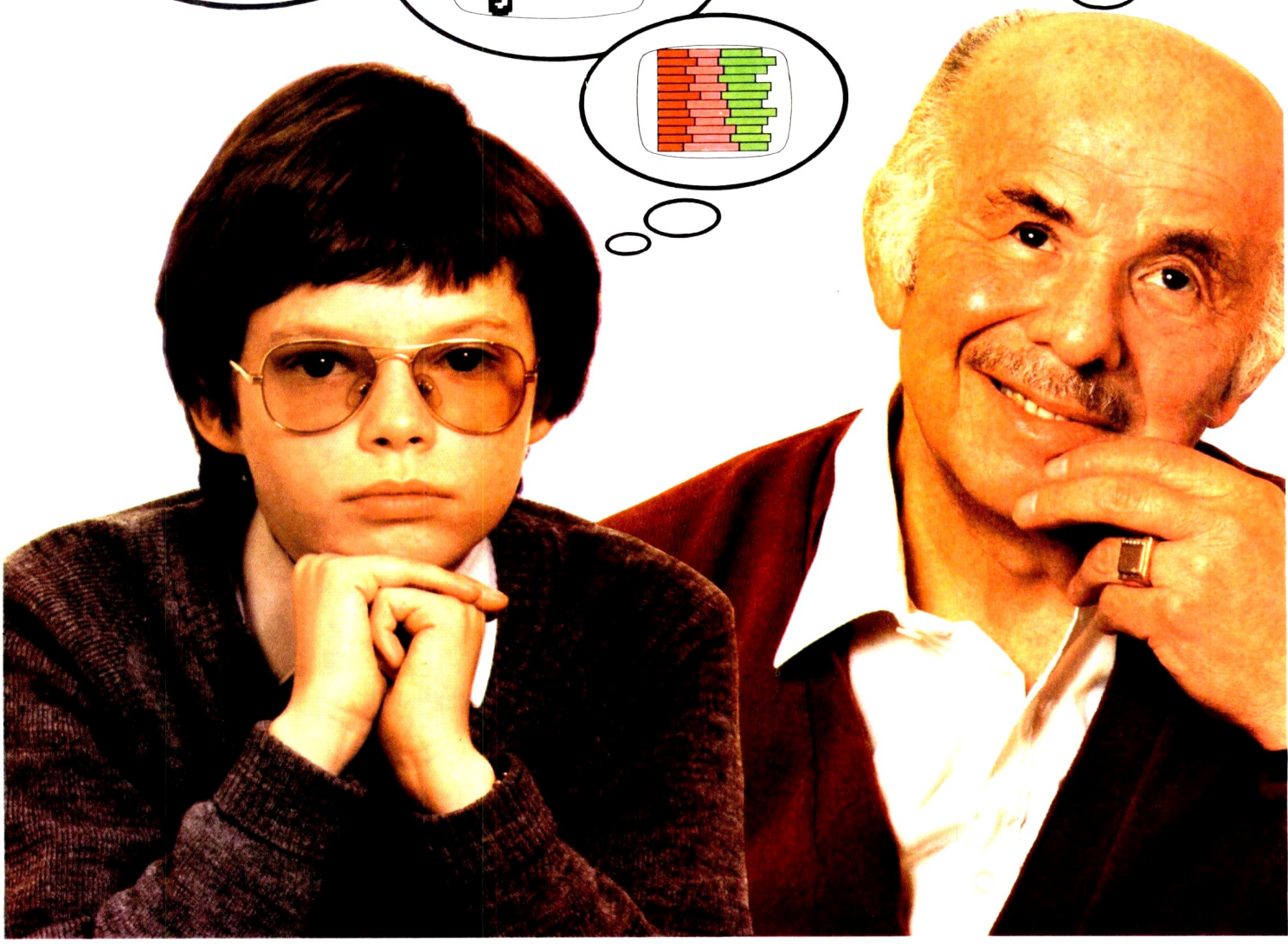
How can one computer be all things to all users — from a sixty year old to a six year old?

Simply because the CGL M5 has been developed in Japan as a sophisticated 'add-on' computer system. With the back up of a unique software system.

As your computer abilities grow so the CGL M5 will expand to meet them. One of the first things you'll







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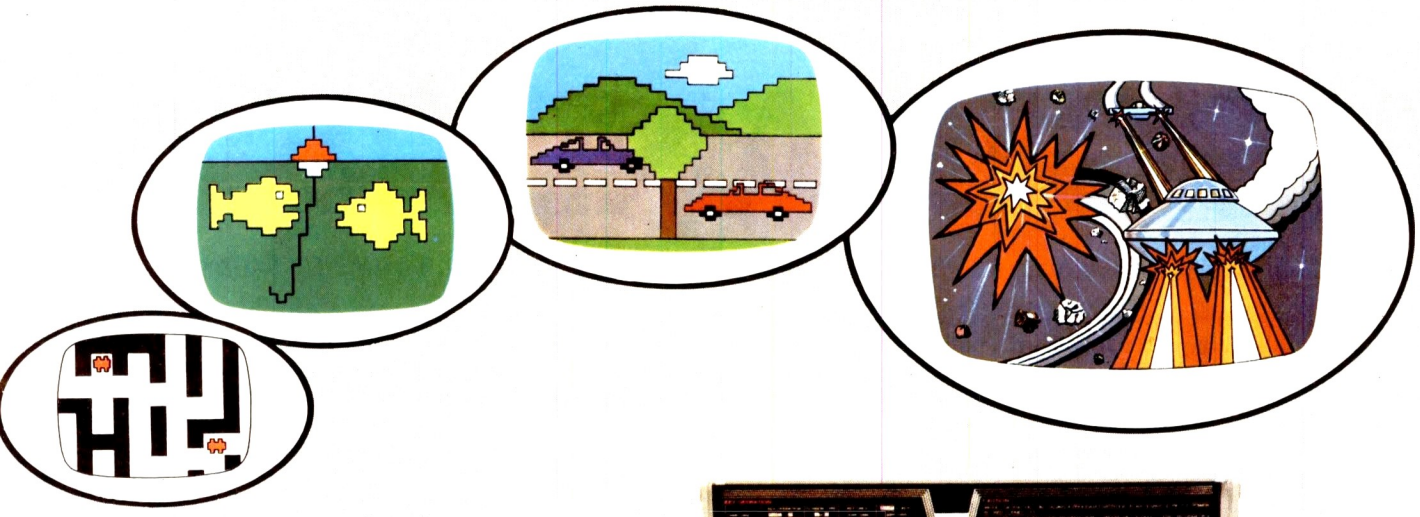

discover about the M5 is its amazing colour and graphic reproduction, whether it's bringing life to your own animation or pre-programmed cassettes and cartridges.

The graphic modes capability of the M5 is just one of the features that sets this computer in a class of its own.

It also incorporates a mini-synthesiser. Slot in the Basic G cartridge and you can compose to your ears' delight. The addition of a Basic F cartridge lets you do more complicated scientific, technical and arithmetical applications. There's also the FALC cartridge which gives you an easy to use data management and family accounting package.

And the CGL M5 is still growing. With an ever expanding library of cassettes and cartridges. Do yourself and your family a service — don't buy a home computer until you've found out more about the remarkable CGL M5.

CGL M5
HOME COMPUTER

and those that might.

For full details and a technical specification of the new CGL M5 send us this completed coupon. Apart from the full-colour brochure we'll also rush you the address of your nearest stockist. Be sure to see a demonstration.

The CGL M5. It might be the best family decision you'll make for years.

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PCW/8/83

EXPANDABLE N

The Lynx micro-computer system is designed to grow as your needs grow.

When you want a more powerful machine you don't have to bin your Lynx, simply upgrade it.

At the 1983 PCW show you can see and use the 48K and

See us on stand 212 (Hall A, Upper level) a

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OT EXPENDABLE.

96K Lynx personal computers – and the exciting new 128K Professional micro, complete with CP/M* operating system.

Plus a range of Lynx peripherals that includes disk drive, parallel printer and joystick interfaces and our latest games, educational and business softwear.

e 1983 Personal Computer World Show.

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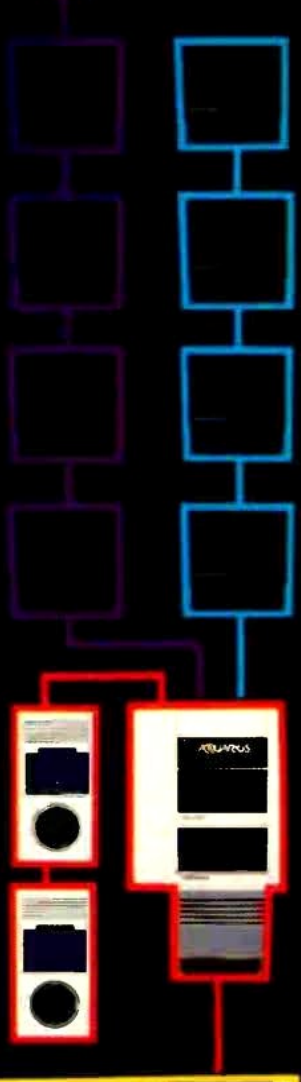
● *This is an entirely new computer system. It was designed with both eyes fixed firmly on the future. So that whatever shape the future takes, we'll be able to fit it into the system. Just as simply as the peripherals and software already available fit into the system. That way, the system will grow with you. And you'll never get left behind.*

● *Based around the Z80A microprocessor, and utilising Microsoft™ BASIC, Aquarius™ has 8K ROM and 4K RAM resident within its console. It is able to provide up to 16 colours and resolution of 320x192, and generates its sound directly through the television's speakers.*

● *With twin cartridge ports, the mini-expander allows simultaneous use of additional RAM and software cartridges. Twin disc game hand controls are included and the unit provides two additional sound channels. The 16K RAM cartridge plugs into either the console or the mini-expander, increasing Aquarius™'s RAM capacity to 20K.*

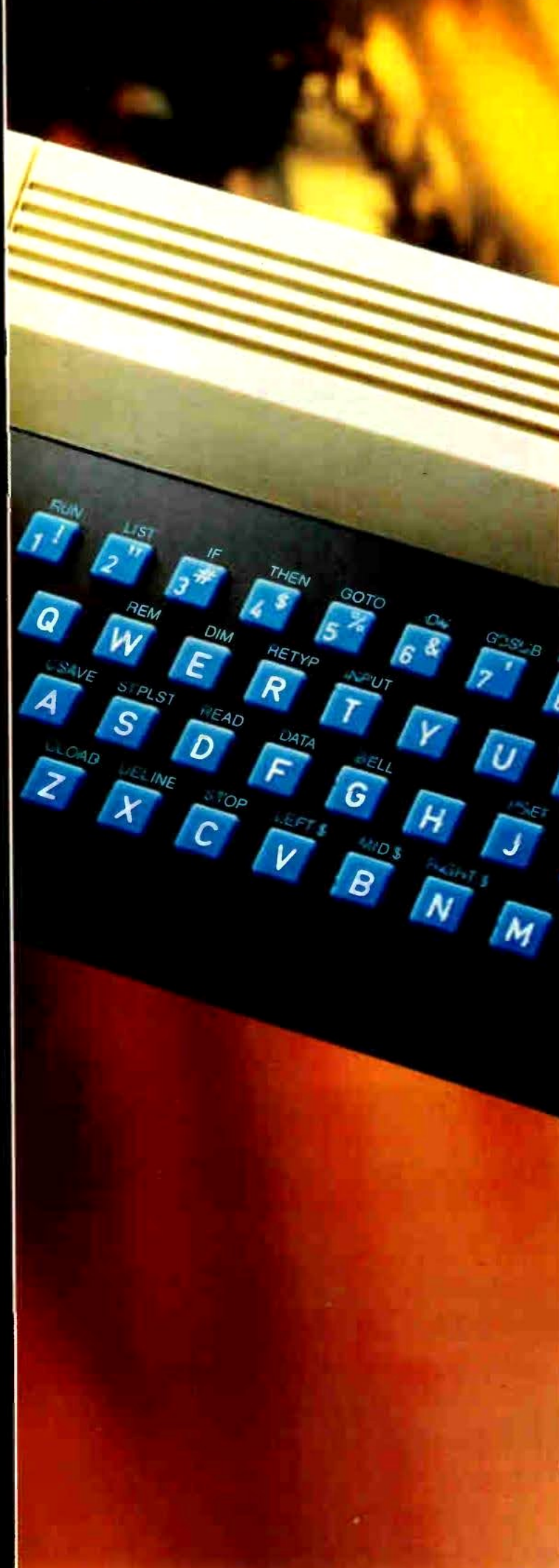
● *With the ability to reproduce the entire graphic and character set of Aquarius™ at 80 characters a second, the printer's 40 column output allows transcription of the complete monitor image.*



● *Using standard audio cassettes, the data recorder provides storage for programs and information, and allows the use of cassette based software. Incorporating a digital tape counter and transmission indicator, it operates sequential searching.*

● *A large number of games, designed to take advantage of Aquarius™'s sophisticated colour and sound capabilities, are available on cartridges that plug into the console either direct, or through the mini-expander. Cassette based games can be used via the data-recorder.*

● *A wide range of preprogrammed cartridges is available, including the LOGO teaching program and practical home data systems like FILEFORM™ and the spreadsheet calculator package, FINFORM.™*



AQUARIUS™
HOME COMPUTER SYSTEM

WITH AQUARIUS, YOU WON'T GET LEFT BEHIND.

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WHATEVER HAPPENS IN THE FUTURE, IT'LL FIT INTO THIS SPACE.
COPY
POP
NEXT
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POKE
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AQUARIUS™
BASIC is a trademark owned by and used under license from Microsoft Inc

The new Commodore 64 is the most powerful personal computer available to the businessman.

And amazingly, it's one of the least expensive.

A brilliant example of micro-computer technology, it will do a lot to make your business more efficient and more profitable.

The range of software – general and specific – is very extensive, and covers financial planning, word processing, information handling and countless other business and personal tasks.

The Commodore 64 is the ideal personal computer for the office. It is also ideal for the home, whether this is your 'second office' or main place of business.

It means that the scope of take-home work is no longer limited to what papers can be carried in a bulging briefcase.

A Commodore 64 at home could allow you access to all the information stored at your company office immediately, easily and with complete security, simply by linking up to any TV set or monitor.

For the office. Or the

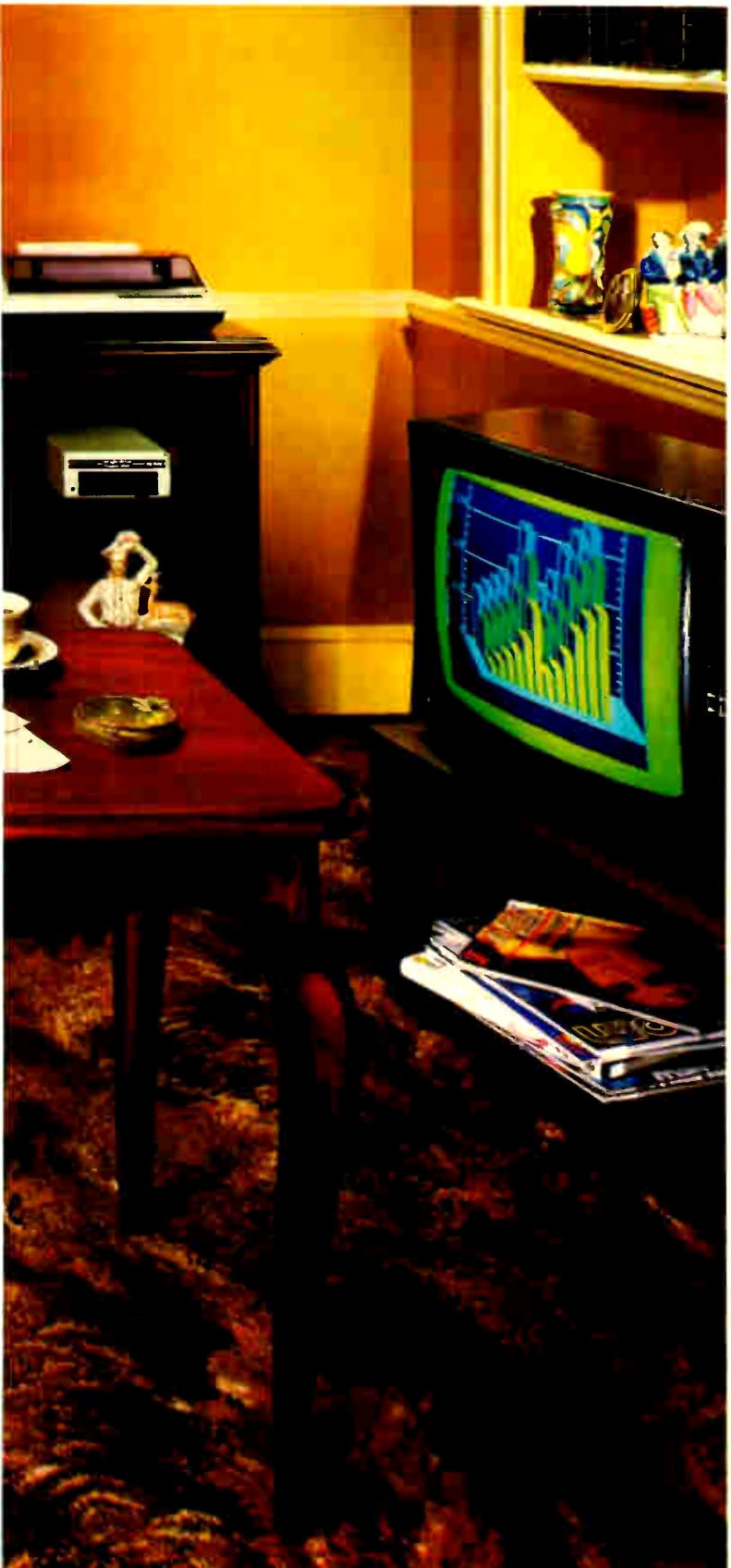
ELECTRONIC MAIL IN MICROSECONDS

You could also link up with other Commodore 64s: in branch offices, for example, or in colleagues' homes, with instant exchange of information.

You could also plug in to half a million pages of Prestel information, making use of key figures in combination with your own calculations for such statistics as you might need; or for other business uses, like car hire and hotel bookings.

The Commodore 64 means maximum flexibility, and provides the facts on which you can base sound business decisions.

home office.



INVALUABLE TO ANY BUSINESS

The Commodore 64 is the perfect computer for your own business, whatever its size. As well as the advantages we've already mentioned, it has a great capacity for expansion, and when combined with various peripherals** it is superbly flexible. Whether it's looking after personnel records or creating models, say, for sales forecasts, it will quickly prove to be of vital importance to any well run concern.

MORE POWER TO THE STUDENTS

A Commodore 64 in education puts more computer power at students' disposal. Subjects include maths, from basic arithmetic to higher functions; vocabulary building; elementary science; basic geography; and of course, learning computing.

FOR EVERYONE WHO HAS A HOBBY

Apart from being an absorbing and fascinating pastime in itself, the Commodore 64 can be a tremendous help in countless hobbies. It's equally happy collating recipes for a cook or choosing moves for a chess enthusiast.

In short, the Commodore 64 is one of the most outstanding microcomputers ever built. Outperforming all other computers in its class (some at twice the price), it's the ideal business partner.
And just as at home, at home.

The 64 from Commodore.

64K memory for £229. Of its kind, unbeatable. At its price, almost unbelievable.

commodore
Changing business for the better.

For more information on the powerful new Commodore 64, and the address of your nearest dealer, telephone or write to us at: The Commodore Information Centre, 675 Ajax Avenue, Slough, Berkshire, SL1 4BG. Telephone: Slough (0753) 79292.

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** THOSE ILLUSTRATED HERE ARE THE DISK DRIVE AND DOT MATRIX PRINTER. OTHERS INCLUDE A CASSETTE DRIVE, JOYSTICKS, PADDLES, PRINTER PLOTTER AND MUCH MORE
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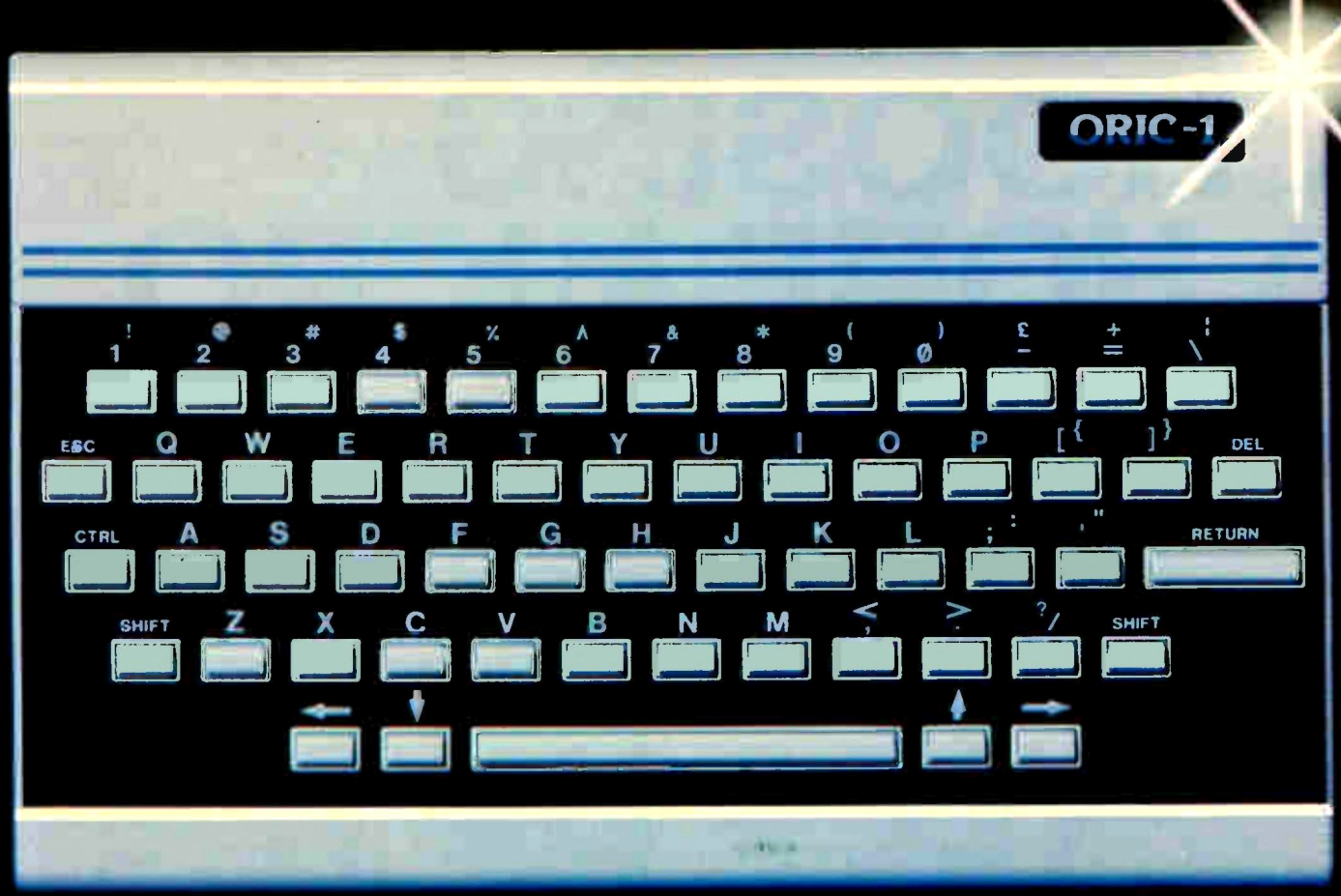


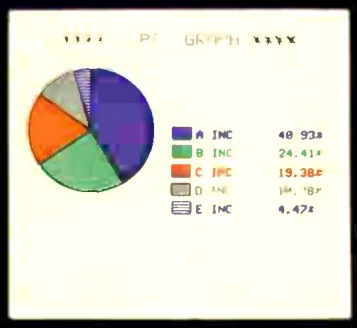
The Growing System

ORIC 3" MICRO FLOPPY DISK DRIVE

Coming soon the incredible new 3" Oric Micro Drives. Small size, Compact, High precision disks with storage capabilities from 100K Bytes to in excess of 1 Megabyte unformatted. With their own built-in power supply, these easy to use units will add big system capability to your home micro.

ORIC MCP 40 COLOUR PRINTER/PLOTTER

The Oric Colour Printer is quality engineered to provide 4 colour hard copy on plain paper, with superb graphics and text capability, printing either 40 columns or 80 columns. It prints in red, green, black and blue, onto a 4½" width standard paper roll. With a print speed of 12 characters a second, the MCP 40 comes with its own power supply and all necessary leads to connect straight into your Oric or to any standard Centronics interface.



This superb printer represents excellent value at just **£169.95 including VAT.**

ORIC PRODUCTS INTERNATIONAL LTD. COWORTH PARK, LONDON ROAD, ASCOT, BERKS.

The right choice for real computing

ORIC-1

Before making your final choice, check any other home micro in the same price bracket, against the incredible specification of the ORIC-1.

Quality of build and materials	Real computer keyboard layout and moving keys
Superb styling / Full colour display	High Resolution colour graphics 240 x 200 pixels
Choice of 16K or 48K RAM	Real computer language programming – Basic / Forth
Latest design technology and circuitry	Teletext/Viewdata compatible graphics (28 rows x 40 characters)
Real sound – 8 octaves plus Hi-Fi output	Cassette Port & R.G.B. output.
Centronics printer interface	Fully supported and growing software library
Colour printer / Disk Drives	A fully expandable system for home, education & small business use
Communications Modem	Full range of peripherals to support your system...

ORIC-1 Setting todays standard in Quality and Price.

ORIC-1 48K £139.95 inc.VAT **ORIC-1 16K £99.95 inc.VAT**

All ORIC computers purchased before 31st December 1983 come with a **£40** voucher off the M.R.P. of the MCP 40 Colour Printer.

MCP 40 COLOUR PRINTER £169.95.
OFFER PRICE £129.95

TANSOFT ORIC Software

NEWS FLASH
LATEST RELEASE
THE HOBBIT

The fast growing success of ORIC-1 means that an incredible number of software titles are becoming available for your Oric. With many well known titles from independent software houses, plus exclusive ORIC SOFTWARE from TANSOFT, you can now drive your Oric towards its full potential.
Below is a small selection from Tansoft's range, all of which offer superb value.

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TANSOFT ORIC SOFTWARE available from your ORIC supplier and all good software dealers. For full list of further information contact:-

TANSOFT LIMITED 3 CLOB MEWS, ELY, CAMBS CB7 4NW TEL (0353) 227 1/2/3/4

The new Electron from Acorn. Ask any child at school why it's worth £199.

Most British children have one thing in common with the new Electron microcomputer: they speak the same language.

You see, the Electron is the first micro remotely in this price range to use BBC Basic, the computer language that is rapidly becoming the standard in British schools.

But that's not all. Most children will feel at home with the Electron as soon as they lay hands on it.

This is because it has developed out of the Micro that has been chosen by over 80% of schools participating in the Government's current Micros In Schools project. It has a similar keyboard and has most of the functions of this much acclaimed (but naturally, more expensive) machine.

So now children will be able to continue their computer studies at home. They'll be able to use the same educational programs they use at school. And, if asked nicely, they'll be able to help willing adults take their first steps into computing.

All this for only £199.

A micro technology break-through.

And now a few reasons for adults why the Electron is such an exceptional machine at the price.

The Electron is neat and compact. Yet it is fast and powerful. (Full details, for the technically minded, are in the box opposite.)

It produces high quality sound using its own internal speaker.

And it offers a range of facilities many larger more expensive machines just cannot match.

For example the Electron's colour graphics have the highest resolution of any home computer.

This is because the chip that controls the graphics, specially designed by Acorn, is one of the most advanced of its kind. As a result, the Electron delivers twice as many characters across the screen as its closest competitor.

Built to last and to grow.

The Electron has been designed and built to be a permanent part of the family, year in year out.

Particular care has been paid to the keyboard. It is electric typewriter style: robustly constructed with a good, solid 'feel'. It has a space bar, and single entry keys for key commands.

In other words it's comfortable and easy to use, avoiding the need for the manual gymnastics sometimes associated with calculator style keyboards.

And it will grow with you via expansion modules, that Acorn are developing, to take peripheral additions such as printers and disc drives. So as your knowledge, interest and ambitions develop, the Electron can develop with you.

Additionally, to give you all the support you'll need to generate your own applications software, we've established a phone-in service attended by specialists to give advice, encouragement and practical help.

A gentle teacher.

The Electron plugs straight into virtually any TV set and cassette player so you will be

ready to go as soon as you get it home.

It comes not only with a comprehensive user guide, which describes the machine and its functions, but also with a book that takes you step by step through the basic principles of programming.

EXPERTS LIKE 'WHAT MICRO?' AND I RATE THE ELECTRON HIGHER THAN ANY OF THE COMPETITION.

A free taste of its versatility.

You will also receive an "Introductory" cassette which will put the Electron through its paces showing you a little of what it can do with its 64k of memory (32k ROM, 32k RAM). The cassette will give you a taste of those exceptional colour graphics we mentioned earlier: of its ability to play and notate music, and show you how it might help in home accounting. It will challenge you to a few games and will, if you ask it, do your whole family's biorhythms in a matter of seconds.

You will in short, through the 15 separate programs it contains, get a glimpse of the Electron's potential. But only a glimpse, for that potential is as limitless as your own interest and imagination.

A widening range of software.

To help you realise some of that potential, Electron software already ranges from "Personal Money Management" through "Starship Command" to "Creative Graphics" (which, incidentally, includes some spectacular three-dimensional rotating shapes). Naturally, with its strong educational links, educational software will be extremely important for the Electron and even now O and A Level revision papers are being processed for Electron users.

How to get your Electron.

The Electron is available from selected W H Smith and local Acorn stockists. However, if you would like to order one with your credit card, or if you would like the address of your nearest supplier, just phone 01-200 0200.

Technical Specifications

Hardware.
2MHz 6502.
32K ROM 32K RAM (64K total).
High resolution graphics 640 x 256 max.
Seven display modes.
8 colours and 8 flashing colours.
1200 baud CUTS tape interface with motor control.
Expansion bus for add-on interface modules.
Internal loudspeaker.
PAL UHF output to colour or black and white domestic TV.
RGB output for colour monitor.
56 key full travel QWERTY keyboard with spacebar.

Software.
BBC BASIC.
Extensions include interger, floating point and string variables, multi dimensional arrays: IF . . . THEN . . . ELSE, REPEAT . . . UNTIL, procedures with local variables.
Operating system allows plot, draw and fill commands.
Event timing.
Built-in assembler.
6502 assembly language can be mixed with BASIC.

The Acorn Electron.

NEW
LOW PRICE
£109.95
OR LESS
TEXAS INSTRUMENTS
HOME COMPUTER

The unbeatable TI Home Computer. It's all the computers your family will ever need.

Buying a home computer is something you have to get right first time. It's too late when you've got one to find it won't take plug-in software. Or can't be programmed without an expensive accessory.

The TI Home Computer is a real computer system

The TI Home Computer has got the memory power you might expect from more expensive computers, built in. At its heart is a powerful TMS 9900 16-BIT Microprocessor. Most other home computers have only an 8-BIT. And you can expand the memory from 16K of RAM up to 52K.

The total memory capacity is 114K Bytes.

A wide range of software for everyone

Another feature that makes the TI system so powerful, yet so easy to use is Solid State Software.™ These plug-in cartridges cover everything from space games like Parsec™ to teaching maths, managing home finances and composing music. And the range is getting wider all the time.

It even has what professionals look for in a home computer

CPU: TMS 9900 16-BIT, plus 256-byte Scratchpad RAM.
Memory: Total 114K bytes; 26K bytes ROM internal; up to 36K ROM cartridges external; 16K built-in RAM expandable to 52K bytes.
Keyboard: 48 Key QWERTY, alpha lock, function key auto repeat.
Sound: 5 octaves, 3 simultaneous tones, noise tone.
Colour: 16 foreground and background. High resolution.
Interfaces: Cassette, TV, 2 joysticks, main peripheral port.

™ trademark of Texas Instruments.

More than one programming language

The standard programming language, TI BASIC, is built into your TI Home Computer so you can begin programming right away. But there's an expanded range of optional languages like Extended BASIC, TI Logo, USCD-Pascal, TI FORTH and Assembler.

With these you can fully expand your programming skills.

A wide range of peripherals

Most computers lose a lot of memory when you add peripherals. The TI Home Computer is different. Every peripheral comes with its own built-in programs to keep the loss of memory to a minimum.

The convenient Peripheral Expansion System houses up to eight peripherals. Additional hardware cards simply plug in. You can even add a complete Floppy Disk Memory System.

The peripherals include memory expansion, RS232 Interface, P-Code card and more. There's also a sophisticated matrix printer and Solid State Speech™ synthesizer – which you can use with your own TI BASIC programs.

A lot more for no more

The TI Home Computer gives you so much more without costing more. At today's price it's exceptional value. Take your family round to try one. If you never try it you'll never know what you're missing.

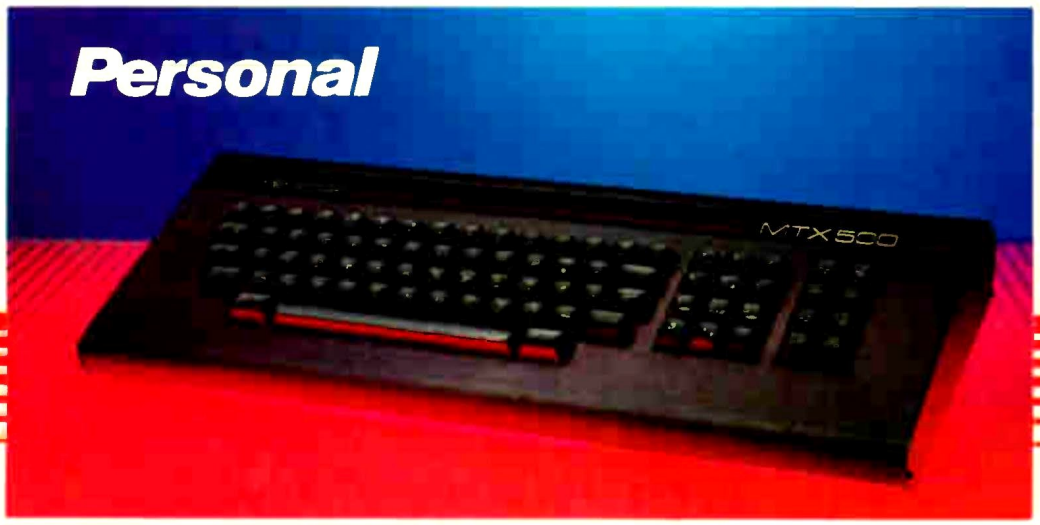
TEXAS INSTRUMENTS

Creating useful products and services for you.

Personal and Profes

MTX500 £275 **MTX512 £315** Available in September–please phone for sales information Memotech products are designed and made in Oxford and Witney

Personal



Profess

The All-Purpose System

The MTX Series is a new departure in micro-computer technology. Whether your needs as a user are for personal programming, games playing, scientific or process control, educational or business use the MTX Series is already capable or very easily adaptable to almost every application. Glance through the standard features below - you'll see what we mean.

Software

The MTX's 24K ROM contains several languages and routines which enable the novice or the experienced programmer to make full use of the machine. Standard languages are MTX BASIC, MTX LOGO commands, NODDY. ROM routines include an ASSSEMBLER/DISASSEMBLER with screen display of the Z80 CPU registers, memory and program, which can be manipulated from the keyboard. Machine code programs can be stepped through one instruction at a time, and easily called from within BASIC programs. A further feature is the Virtual Screen facility which enables the programmer to split the screen into a maximum of eight sections to work independently whilst maintaining all full screen facilities. Pascal is available as an add-on ROM pack.

Hardware - 32K RAM on the MTX500, 64K on the MTX512.

The MTX500 has 32K of user RAM as standard (64K on the 512), expandable to 512K plus 16K of video RAM, controlled by a separate Video Processor. Sixteen colours, 40 column text, 256 x 192 high resolution graphics with all sixteen colours available, and 32 easily moveable user defined graphics characters (Sprites) combine to make effective screen displays quick and simple to achieve. Standard outputs are centronics printer port, two joystick ports, an uncommitted I/O port, 2400 Baud Cassette port, separate TV and Video Monitor ports, 4 channel sound with hifi output plus a dedicated cartridge port. Other standard features include the Z80A processor running at 4MHz, real time clock, full moving key keyboard with 79 keys including eight 2-function keys and separate numeric pad.

The Disc Based Computers from Memotech

Designed to use the full power of the MTX computers the FDX and HDX make perfect business systems at prices which make perfect business sense. Both feature the CP/M operating system, giving instant access to a wide range of proven application software. Available in October these feature:

- *Full Western Digital floppy disc controller set with SASI interface for 4 drives, CP/M types 0-13.*
- *minimal latency, very high data transfer rates*
- *optional Colour 80 Column Board*
- *optional Silicon Discs (1/4 Mb) which dramatically increase the efficiency of 8 bit software to those of 16/32 bit software; increases life and reliability of mechanical drive*
- *permits single disc CP/M operation*

FDX—Floppy Disc System

1 or 2 5 1/4" Qume drives 500K unformatted, 347K formatted,

HDX—Hard Disc System

5 1/4" Qume drive, 500K unformatted, 347K formatted,
5 1/4" Winchester which may be 5, 10, or 20 Mb

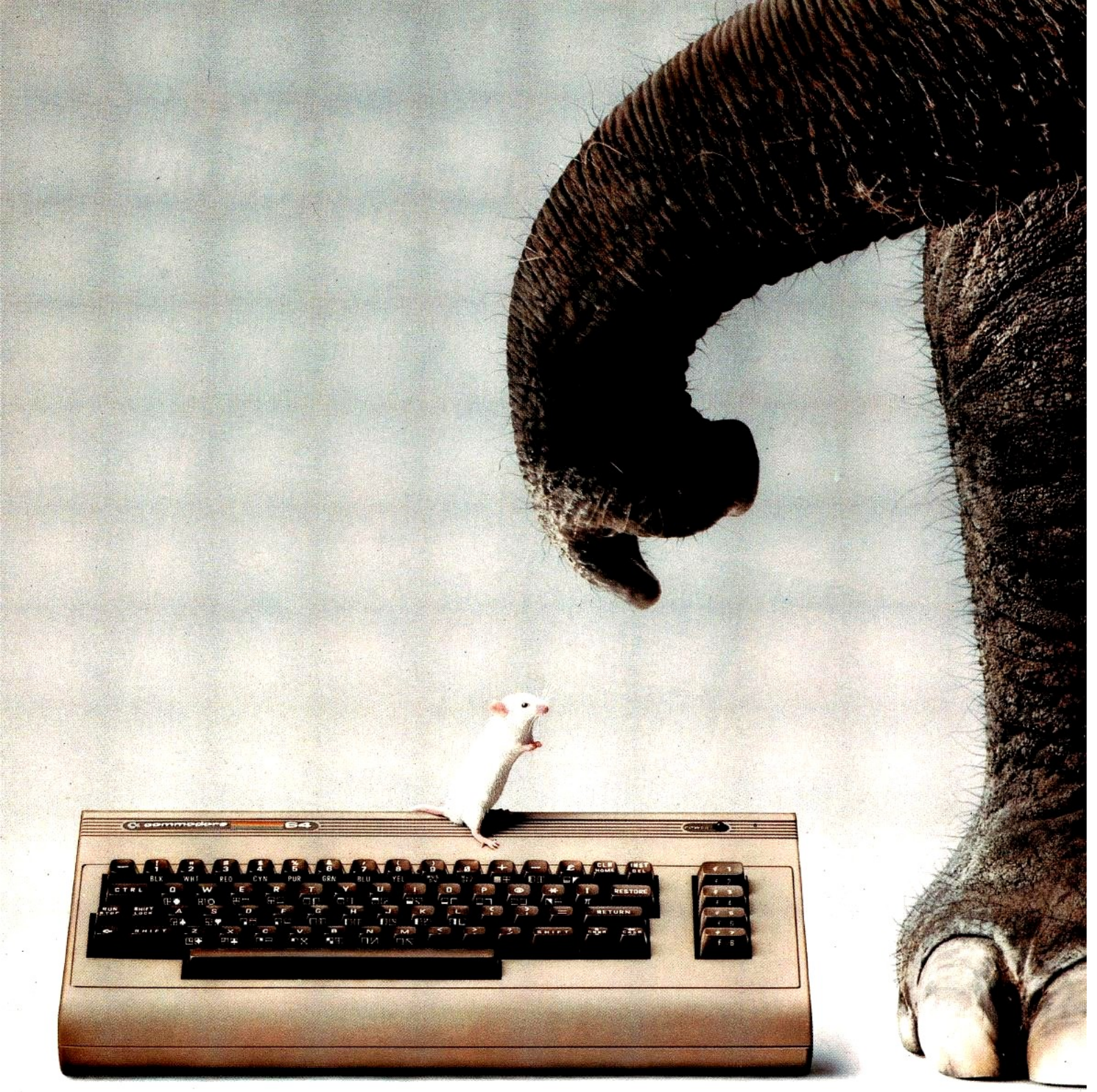
Memotech Limited,
Station Lane Industrial Estate, Witney, Oxon. OX8 6BX.
Telephone Witney (0993) 2977. Telex 83372 Memtec G

MEMOTECH

MTX

SERIES

CP/M is a trademark of Digital Research Inc.



The Commodore 64 is compact and nippy like many other home computers.

The Commodore 64 has an enormous memory: it's a positively elephantine 64K.

If you're unsure as to why you should want a home computer with such a big memory, we'll tell you.

It means you can use more exciting and advanced software.

This means you'll get greater enjoyment out of your home computer because you can do so much more with it.

You can create high resolution graphics or reproduce the sounds of many different musical instruments.

You can broaden your horizons with the library of educational programs. You can teach yourself programming, or you can entertain

YOU CAN SEE THE COMMODORE 64 AT ALL BRANCHES OF DIXONS AND WALLACE HEATON AND AT MAJOR BRANCHES OF BOOTS, RUMBELOWS, W.H. SMITH, LASKYS, CURRYS, GREENS, ORBIT, MENZIES, MAKRO, TE

But its memory... well, that's a little different.

yourself with countless games.

As well as hundreds of software programs, for use both at home and in the office, there's also every peripheral you're ever likely to need.

Turning your 64 into a super sophisticated computer system with a printer, plotter, disk drive and monitor is simple.

Little wonder the Commodore 64 is seen to be the premier home computer, especially with a price tag of only £229, or less.

Makes the name worth remembering, don't you think?

commodore

FOR MORE INFORMATION CONTACT THE COMMODORE INFORMATION CENTRE, 675 AJAX AVENUE, SLOUGH, BERKSHIRE SL1 4BG.

FARE, WIGFALLS, SPECTRUM, COMET, JOHN LEWIS, WOOLWORTH, REDIFFUSION, CO-OP AND OTHER GOOD RETAILERS. ALSO AT BRANCHES OF A NATIONAL NETWORK OF COMMODORE COMPUTER DEALERS.

As your expe
so can your

600XL Home Computer.

Whatever you want your home computer to do, the ATARI 600XL™ can do it.

ATARI 600XL product specifications.

Colour capabilities: 16 colours and 16 intensities. 256 shades.

Memory: 16K RAM expandable to 64K with memory expansion module. 24K ROM operating system including ATARI BASIC programming language.

Sound: 4 independent sound synthesisers. Each with a 3½ octaye range.

Display: 11 graphic modes. 5 text modes. Up to 320 x 192 resolution. Maximum text display 24 lines by 40 columns.

Special ATARI integrated circuits: GTIA for graphics display. POKEY for sound and controller ports. ANTIC for screen control and I/O.

CPU: 6502C microprocessor. 0.56 microsecond cycle. 1.8 Mhz.

Extended graphics functions: High resolution graphics. Multi-coloured character set. Software screen switching. Multiple redefined character sets. Player missile (sprite) graphics. Fine screen scrolling. Changeable colour registers. Smooth character movement. Simple colour animation facilities.

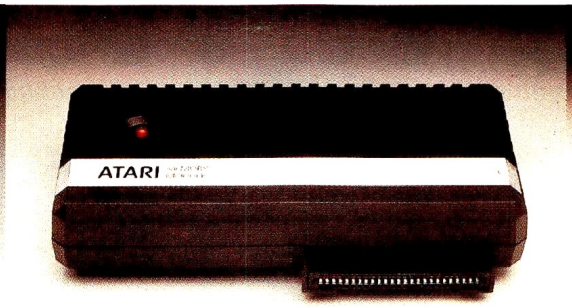
Programming features: Built in ATARI BASIC programming language plus 8 oth languages. HELP key will provide additio information and menu screens. Syntax checking on entry.

Input/Output: External processor b for expansion with memory and peripher 2 controller ports. Serial I/O connector. Monitor output.

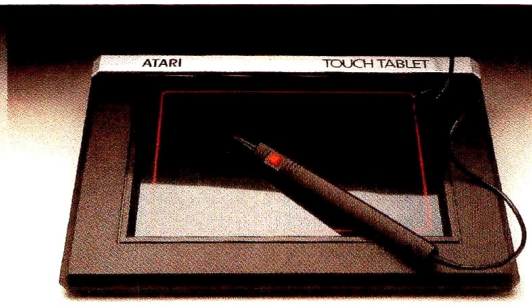
Software: Over 1000 items of softwar available including self teaching progra with unique voice over. Education. Home management. Programming aids. Atari u written programs (APX). And Atari's famo entertainment software.

rience grows Atari 600XL.

1. Program Recorder.

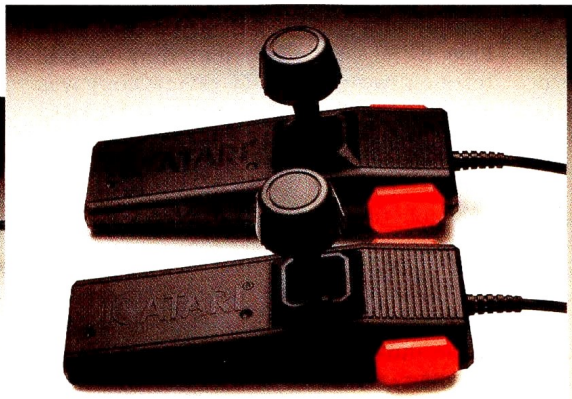


2. 64K Memory Module.



3. Touch Tablet.

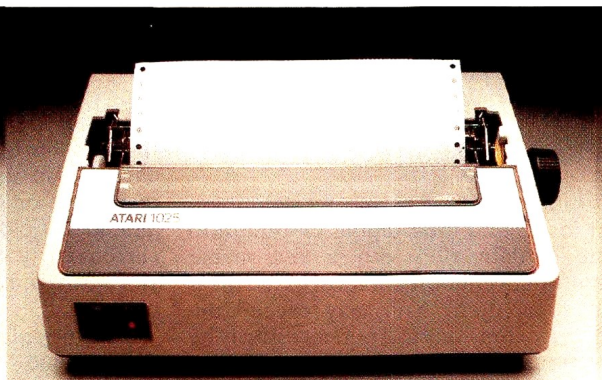
4. Trak Ball™ Controller.



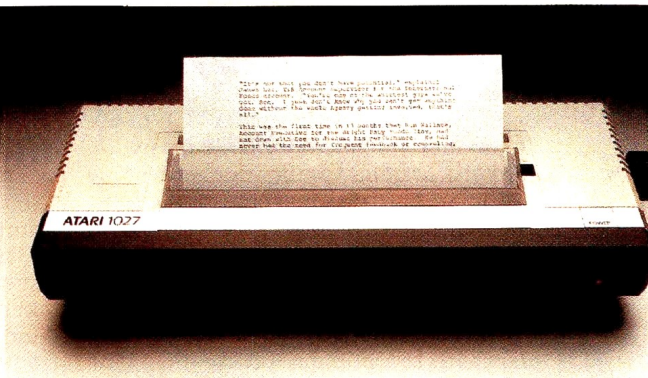
5. Super Joysticks.

6. Colour Printer.

7. Disk Drive.



8. 80 Column Dot Matrix Printer.



9. Letter Quality Printer.

These peripherals will be available soon:

1. ATARI 1010™ Program Recorder for low st storage and retrieval capability. Data ansmission 600 baud. Storage capability 0K bytes on a 60 minute cassette. Track nfiguration 4 track, 2 channels (digital d audio). Auto record/playback/pause ntrol.

2. ATARI 64K Memory Module gives the 00XL a massive 64K RAM.

3. ATARI Touch Tablet enables you to int pictures and draw diagrams, with the uch of a stylus.

4. ATARI Trak Ball™ Controller enables cursor movement in any direction; adds to the pleasure of Atari games.

5. ATARI Super Joysticks. Gives you a greater competitive edge over your games.

6. ATARI 1020™ Colour Printer plotter. Four colour graphic print capability. 40 column. 10 characters per second. 5, 10 and 20 characters per inch.

7. ATARI 1050™ Dual Density Disk Drive. 5¼ inch disks holding 127K randomly accessible bytes provides both expansion and flexibility for your 600XL system with DOS III.

8. ATARI 1025™ 80 Column Dot Matrix Printer prints 5, 10 or 16.5 characters per inch. 40 characters per second. Ideal for program listings, financial reports, etc.

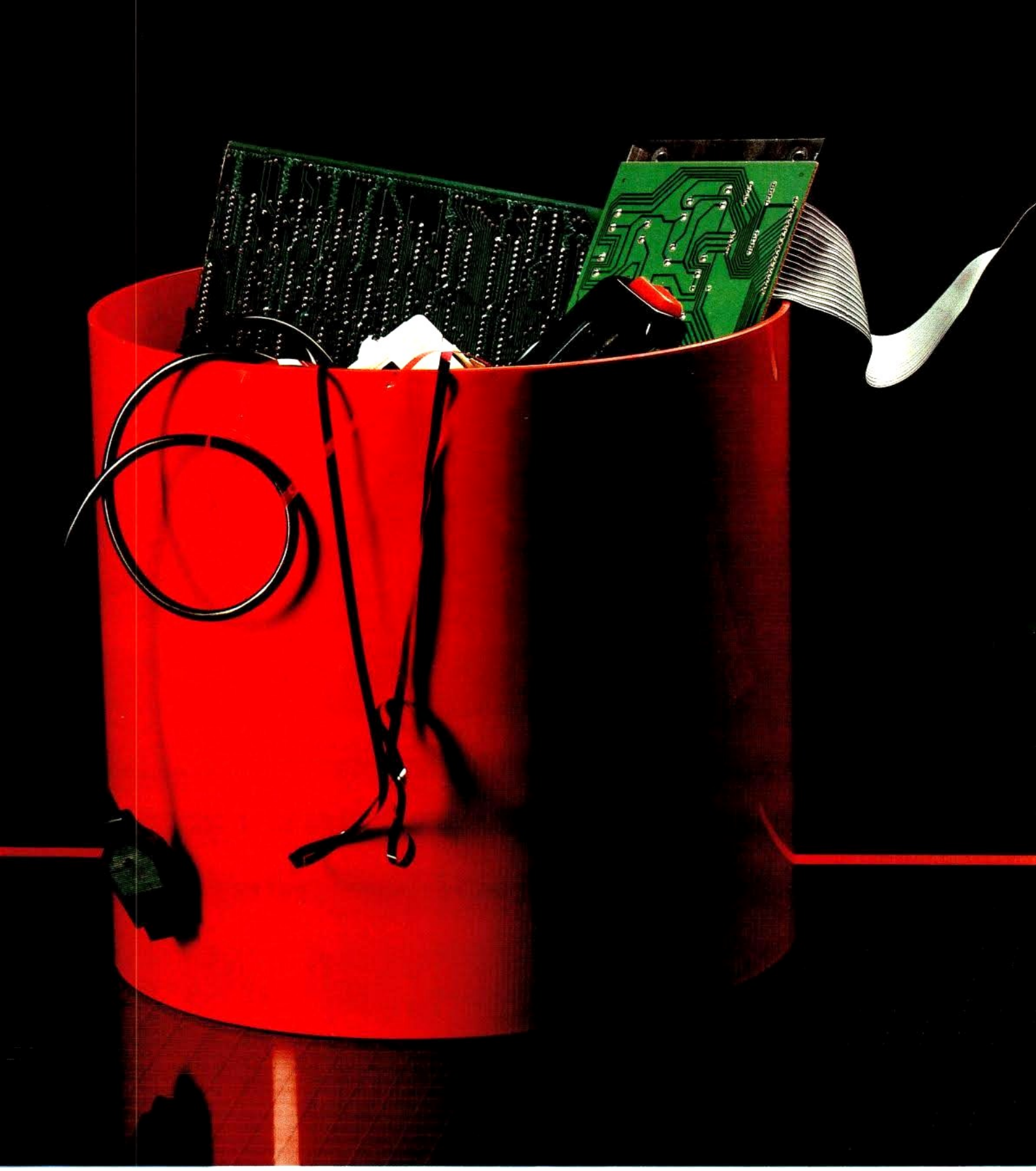
9. ATARI 1027™ Letter Quality Printer for word processing letters in professional type.

If you'd like to know more about the ATARI 600XL, write to Atari International (UK) Inc., P.O. Box 407, Blackhorse Road, London SE8 5JH and we'll send you all the details.

The new Atari XL home computer system.

ATARI®

®ATARI and design. Reg. U.S. Pat and TM Off. TM: Trademark of Atari Inc. The ATARI 600XL is compatible with ATARI 400 and 800 programs.



After you've owned a micro for a while you begin to wish you'd invested in a bigger memory.

But when you want to upgrade you are suddenly faced with a number of problems the brochures didn't mention.

If you have one of the cheaper models you probably won't be able to upgrade at all.

And with some of the more sophisticated machines you will be shocked by the expense of the hardware required to upgrade.

Not with the Lynx.

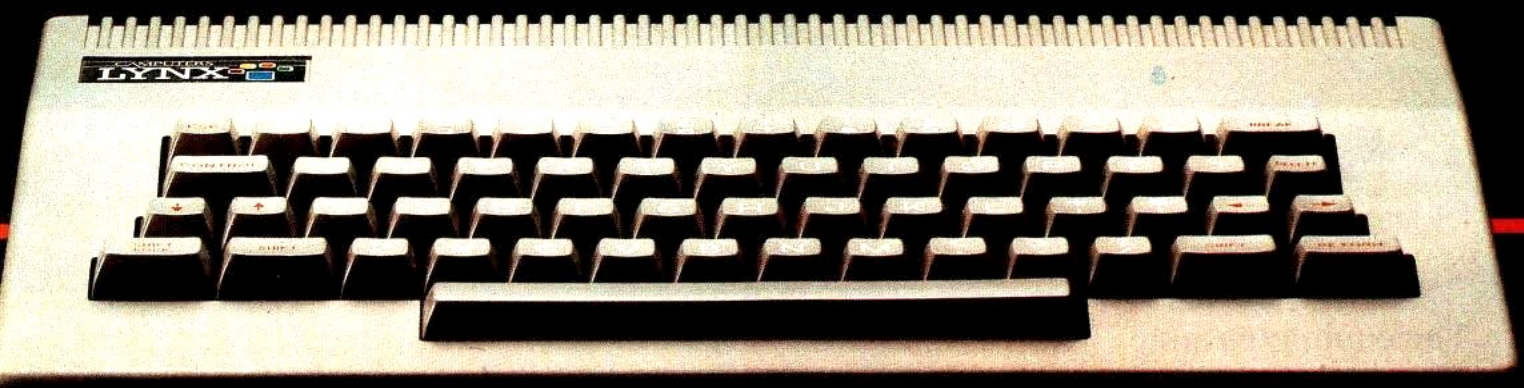
Probably the single most important aspect of Camputers' Lynx is its expandability.

From the start the Lynx was designed to be upgraded – internally. From 48K, to 96K, to a

48K Lynx £225 96K £299 128K £445

Lynx micro-computers, peripherals and software are available from selected nationwide dealer network. For your nearest stockist, telephone 0223-315063

YOU WON'T HAVE TO BIN A LYNX.



lly professional 128K – and beyond.

The 128K Lynx (available December) ith additional Disk Drives opens the door to e exciting world of CP/M* where you will nd a vast range of ready made small business rograms from famous software houses.

You can buy into the Lynx system at a evel that suits you and your family and be assured that when you want to move on to bigger things you won't be left with a bin full of electronic junk.

*CP/M is the trademark of Digital Research Inc.

anches of Dixons, Laskys, John Menzies, Spectrum, Leisurebase, Big M, and a mputers PLC, 33A Bridge Street, Cambridge CB2 1UW.

CAMPUTERS LYNX

EXPANDABLE NOT EXPENDABLE

DRAGON

It's as easy as

DRAGON 64	
MICROPROCESSOR	6809E
MEMORY	64K RAM 16K ROM with 4 pages graphics 41K
ANALOG/ DIGITAL PORTS	RS232 serial interface, 2 joysticks, cassette I/O plus 1 Centronics parallel printer port.
OTHER OUTPUTS	1 x 40-line connector with data lines for ROM hardware and peripheral expansion; 1 x UHF TV output with sound and video signal; 1 x monitor output for PAL-encoded composite video and sound.
KEYBOARD	53 keys, typewriter-style full QWERTY keyboard; optional auto-repeat on all keys; guaranteed for 20 million strokes.
DISPLAY TEXT	24 rows x 51 characters when using OS-9; blue cursor when in 48K mode.
GRAPHICS + SOUND	Full Microsoft extended BASIC allowing high resolution graphics up to 256 x 192 pixels. Sound generated through TV speaker.

Why buy three machines when you can buy one? The new Dragon 64 has three modes.

In the first it emulates the successful Dragon 32, and uses the wide range of already available software.

All the peripheral interfaces available on the Dragon 32 are supported, plus the extra RS232C port for communication with the outside world.

The second gives you 48K RAM directly available for use with the powerful 16K Microsoft BASIC.

As the BASIC is in RAM, it can be altered to suit your special requirements.

one, two, three

The third mode gives you access to the full 64K RAM, so you can work with other languages: FORTH, PASCAL, C and structured BASICO9.

Add the Dragon Disk Drive unit and your Dragon 64 and OS-9 becomes your passport to the world of professional computing - spreadsheets, word processing and business packages.

OS-9 is UNIX-like, multi-user, multi-tasking operating system which allows you to use a range of highly sophisticated application software.

All in all, one, two, three adds up to a great deal more than just another home computer.

THE DRAGON 64 AND THE DRAGON DISK DRIVES ARE AVAILABLE FROM ALL LEADING COMPUTER SUPPLIERS.

DISK DRIVE	
Disk type	5¼" mini diskette
Memory capacity	(Formated) 184320 bytes
Disk organisation	Single-sided Double Density 40 tracks (TPI) 18 sectors per track 256 bytes per sector Directory on track 20
Case	Coated steel, capable of holding two half height drives
Power Supply	240v 50Hz 37 watts Capable of operating two drives
Overall dimensions	115mm H x 160mm W x 260mm D
Weight (with one drive)	4.4 kg

After blasting try exploding

Dragon Selection
Personal Finance
Dreambug
Chess • Dream

YOUNG LEARNING SERIES.
Number Puzzler
Number Gulper • School Maze
Circus Adventure • Hide & Seek

ARCADE GAMES.
Berserk • Doodle Bug
Cosmic Invaders
Shark Treasure • Flag
Whirlybird Run

ADVENTURE GAMES.
Mansion of Doom
Shuttlezap • Eno/Stalag
Quest • Dragon Mountain

Just a selection from our range.

What do home computers mean to you?

Do they conjure up images of '1984' and 'Brave New World'?

Or do you think of them as advanced video games?

The subject is shrouded in myth. One or two of which we hope to clear up (with a little help from the Dragon 32).

Video games are a great introduction to the world of the home computer.

But there's more to them than simply saving the universe.

"THEY'RE JUST A TOY FOR KIDS."

True they can be used as a toy. To prove it we've produced a wide range of high quality software aimed at the games player.

But to use a Dragon simply to play games on is rather like buying a car just to listen to the radio.

So what else is there? Well, there's programming.

We've even produced some software that'll help you master the basics.

Then there's Typing Tutor, a program that's particularly useful on the Dragon 32 thanks to its professional quality keyboard.

In fact our software range has something for just about everyone, from our Young Learning series right through to Computavoice, a program that can actually make your Dragon speak.

Take a look at the sample list provided and you'll see just what we mean:

"THERE'S NO POINT BUYING ONE NOW."

Computers, like anything else, can seem a little daunting if you don't start right at the beginning.

But, basically, they are logical and easy to understand.

Especially if you start with a home computer that is logical and easy to understand.

Like the Dragon 32.

some aliens, a few myths.

Maybe, though, you want to wait a while.

After all computers are advancing all the time. Aren't they?

True. But there's no point getting very advanced equipment if you don't know how to use it properly.

Besides the Dragon 32 is versatile enough and has a large enough memory to be able to cope with all your family's computing needs for years to come.

"YOU HAVE FORTUNE TO SPEND A TO GET A 'PROPER' ONE."

The Dragon 32 is a proper computer. As standard it offers a massive memory, together with many functions you'd only expect in a much larger (and more expensive) machine.

Yet it will only set you back £175.*

That's certainly no fortune for a machine with specifications like these.

6809E MICROPROCESSOR. The most powerful eight bit processor available
32K RAM (as standard). At least twice the memory of most similarly priced machines.
EXTENDED MICROSOFT COLOR BASIC (as standard). Featuring: ADVANCED GRAPHICS (set, line, circle, paint, print, draw, rotate and print using). ADVANCED SOUND 5 octaves, 255 tones. AUTOMATIC CASSETTE RECORDER CONTROL. FULL EDITING with INSERT and DELETE.
PRINTERPORT (Centronics parallel).
9 COLOUR, 5 RESOLUTION DISPLAY.
USE WITH ANY U.H.F. TV and/or separate P.A.L. monitor.
PROFESSIONAL QUALITY KEYBOARD. Typewriter feel. Guaranteed for 20 million depressions.
JOYSTICK CONTROL PORTS.

"YOU NEED A SCIENCE TO UNDERSTAND THE DEGREE JARGON."

This is where the Dragon really scores. Our handbook was designed to be easily understood (as was the whole machine), even by people totally new to computers.

"It is better than most, comprehensive and easy to read." (Thank you Personal Computer World.)

So you won't have to keep asking the kids how to use it.

And as computers begin to play a bigger role in our lives, so a knowledge of them becomes more important.

Many schools have already recognised this, and computer studies is commonly taught.

Mind you it'll never have the 'dull' tag attached to it like other subjects, because computers (especially home computers) are great fun.

How else can you save the universe in your own front room?

DRAGON 32

The first family computer.

GENIE

GENIE I
16K £330.05
48K £365.70

GENIE II
16K £299.00
48K £341.55

GENIE

A much more . . . able computer for your money!

Get in touch with Lowe Computers at Matlock for a list of your nearest Genie specialist dealers!

...able

GENIE III
£2,240.50

COLOUR
GENIE
£224.48

LOWE
COMPUTERS

Lowe Computers Ltd., Chesterfield Road, Bentley Bridge, Matlock, Derbyshire DE4 5LE. Telephone (0629) 4995/4057 Telex 377482 LOWLEC G.

More K's.

Now reduced from £399.99 to only
£299.99
(SRP inc. VAT)

ATARI 800,™ upgraded from 16K to 48K RAM

Less £'s.

Now only
£149.99
(SRP inc. VAT) plus FREE
Programmer Kit normal
SRP £39.99

ATARI 400,™ with 16K RAM

It's hard to know which set of figures is more attractive. Certainly the ATARI 800™ Computer, upgraded by an astonishing 32K and reduced by £100, will have its admirers.

However, the ATARI 400™ Computer plus free Programmer Kit for only £149.99 makes it remarkable value for money, particularly when you take into account its 16K RAM (on some computers you'll be charged extra to upgrade to 16K).

It's even more remarkable when you look at our computers feature by feature.

The Family Computer.

Before we designed them, we thought about who was actually going to use them.

One day our computers might be playing games; next, they're wrestling with household budgets; teaching geography to an 8-year-old; or printing letters.

In other words, we designed our computers and software for as many applications as a family has ideas. (Now the ATARI 800 Computer has 48K RAM, there's even more memory for even more applications.)

Next we built in high-resolution graphics. Inside our computers, we have a microprocessor whose only job is to operate our graphics.

(All told, you can choose up to 16 different colours in 16 intensities, which gives you a spectrum of 256 different shades.)

In fact, our computers divide the screen up into 60,000 tiny points, each one of which can be changed without affecting the other.

A friend not a fiend.

We also looked at ways to make computers rather friendlier.

On the ATARI 400 Computer, we've incorporated touch-sensitive keys with ridges, so fingers won't slip; on the ATARI 800 Computer, we have keys much as you'd find on a standard typewriter.

You can talk to your computer in a choice of languages (five for the Atari 400, nine for the Atari 800), including ATARI BASIC, using software which you load in on cartridge, cassette, or disk.

For our computers, we have one of the largest software libraries in the world: everything from speech synthesis to sophisticated data management.

No doubt you know all about our famous games such as PAC-MAN†, SPACE INVADERS† and STAR RAIDERS,™ winner of the 1982 Game of the Year Award.

However, we also boast home and office application software as well as educational programs to satisfy the most enquiring mind.

You can learn French, Spanish, German or Italian on our computers and through our unique 'sound through' system you'll hear the language and learn it the way you learnt your mother tongue. (Other computers will leave you speechless.)

You can teach yourself touch typing, compose and play your own music or teach a child the alphabet.

On another program you can find out if your current mortgage is giving you the best value for money; while yet another program will answer a question that has vexed mankind for generations: "Where does all my money go?."

At the same time, the outstanding VisiCalc* program is available for the ATARI 800 Computer.

Write your own programs.

As if all that isn't enough, through Atari's Program Exchange (APX), you can have access to a wide range of the most imaginative programs written by our users.

Or you can learn to write your own programs with the help of our 'Invitation to Programming'™ series, using our unique 'sound through' system.

Surprisingly, you won't have to plough through a small library of manuals to do so, since most of the series is on software, not in hard books. Of course, we've always had just about everything you're looking for in computers.

From today, we've got even more.

Atari 400 and 800 Home Computer Technical Specifications.

Colour Capabilities: Choose from 16 colours, and 16 intensities (up to a total of 256 shades).

Sound: Four independent sound synthesisers for musical tones and games sounds. Three and one half octaves. Variable volume and tone for each voice.

Display: Three text modes: 24 lines of 40 characters, double-width characters, or double-height, double-width characters. Nine graphic modes: from 40 columns by 24 rows up to 320 columns by 192 rows.

Memory: Includes a built-in 10K Read Only Memory (ROM) Operating System with 48K Random Access Memory (ATARI 800) and 16K Random Access Memory (ATARI 400).

C.P.U.: 6502B Microprocessor 0.56 micro-second cycle. 1.8Mhz.

Special Features: Three customised integrated circuits.

Extended Graphics Functions: High-resolution graphics. Multi-coloured character set. Software screen switching. Mixed text and graphics modes.
Multiple re-defined character sets. Player missile (sprite) graphics. Fine screen scrolling in any direction. Changeable colour registers. Smooth character movement.

Peripherals: A range of peripherals and accessories that are available now.

ATARI®
A Warner Communications Company

More of what home computers are for.

®ATARI and design. Reg.in UK. ™Trademarks of Atari Inc. †Pac-man and characters are trademarks of Namco Ltd. †Trademark of Taito America Corporation. *Trademark of Visi Corp.

There's a huge choice of micros around. Each with a different 'reason to buy'.

One might have fantastic graphics, but with a sound output like a pebble in a tin can.

Another may win every brownie point in the book on games. But with programming difficulties that make your brain ache (let alone your finger tips) . . .

For your micro, it's no good having one star in the team. You need all-round performance that wins with flying colours (all 16 of them!). And backed by a knowledgeable dealer network that will help you explore the exciting world of micros.

THAT'S COLOUR GENIE

Owning one means that when you want to do something new, you won't have to throw away months or years of experience. And you'll find that for whatever reason you first buy a micro – you'll develop new interests immediately!

It means that once started, you can progress to be an experienced programmer. From fantastic games, to professional program applications.

SOUNDS CHALLENGING?

It's meant to! Because Colour Genie is fast and powerful enough to offer you the most exciting challenges in entertainment and education, at home and at work.

PROGRAMMABLE

Fast Z-80 chip with very programmable Microsoft* BASIC Extended held in 16K ROM.

128 programmable characters with programmable screen for text and display. Plus 128 pre-set graphics on the keyboard.

4 programmable function keys in each shift plus auto-repeat on all 63 keys.

And to help cure any of your programming bugs – Colour Genie has a full, powerful editing facility!

MEMORABLE

On 16K RAM, virtually 90% is available for you to use. Rising to a staggering 95% with the 32K RAM option. That indicates design efficiency and some **very** experienced programming.

It's not RAM size that counts – it's the usable RAM that matters!

ADAPTABLE

Screen text display is a full 40 across x 24 down. In this mode you can build up to 128 complex graphic shapes. Using the highest screen resolution of 320 x 192.

With up to 16 colours on screen (8 colours and 8 hues), get the shapes to 'move' over the screen with a 3D effect. Or you can use full-screen high graphics resolution at 160 across x 96 down in 4 colours with background colour.

In both modes, you can mix upper and lower case text with graphics.

Colour Genie
Quite simply, More . . . able

Available, and affordable!

Only £194

(including VAT)

Send NOW for full details.

LEARNABLE

Colour Genie even comes with 2 manuals. A beginner's guide, and one to take you through the first steps of BASIC, the English 'shorthand' that the computer understands (shown here with optional joystick controllers).

SOFTWARE AVAILABLE

Find the Diamond of Balmarion
The Vegan Incident
Enchanted Garden (requires 32K)
Toad Mania!
Space Fighters
Racing Driver
Mysterious Adventure Series (7 programs)
Invaders from Space
The Chomper
Cosmic Attack
Zen Editor/Assembler/Debugger
Genmon
Fortress of Evil
The Exterminator
The Graphics Master
The Deep
Double Agent
Electric Etch
Skramble
Kong !!
Blitz
Windscale
Pontoon
Snake
Music
Electronic Organ
Break-Out (Joysticks)
Morse Code Trainer
Rodeo
Lifeboat & Noughts and Crosses
Round Table (Adventure)
Murder at Gosforth Hall (Like Cluedo)
Missile Strike
Galactic Attack
Mousemaze
Asteroid Mission
CSAVERS (Genie 1 to 4 Basic Trans.)
Monitor 3
File Handling
C.G. Copy
Maths Practice Program
CORPLAN (Business and Educational Software)
Character Generator (2 games on reverse side)
Word Processing

COMMANDABLE

SHAPE, SCALE, COLOUR, PAINT, CIRCLE, FILL, PLOT – the list goes on with more than 80 others.

Add more than 40 graphic, arithmetic and other functions. You can see the power behind Colour Genie.

COMPOSABLE

Outstanding facility with 3 sound generation channels. Independent or simultaneous with a full range of 8 octaves on each channel to give the synthesized sound of instruments such as drums, flute and harpsichord. A bomb, a car or a bird!

Programmable pitch, duration and volume.

White noise. Special effects. Full enveloping. Plays through your TV or Hi-Fi (with picture on TV). SOUND AND PLAY commands.

USEABLE

There's no shortage of action-packed games available now. But as your expertise develops, you'll find Colour Genie software to meet your growing skills. From some of the best writers around.

Education, music, business and many other applications.

Regular software update lists. Backed by Lowe Soft, the special Lowe Computers software service. All you need to get the most from your Colour Genie.

ENJOYABLE

Your optional Colour Genie joysticks must be the best in the business!

Slam them hard for explosive screen action. Touch them gently for slow precision. They each use a 6-bit chip and convert from normal analogue to digital response.

And each stick has a built-in numeric pad to help build exciting two player applications.

SHARE-ABLE

The National Colour Genie Users' Group welcomes you! Free magazine every month for the beginner and the pro. Where to get software. Its own software library. User experiences, and the opportunity to sell **your** software on the Group's own label.

GUARANTEE-ABLE

Our optional 2-year breakdown guarantee underlines the reliability of Colour Genie. Only £16.50 from date of purchase.

UNDERSTANDABLE

For everybody new to computers, all the technical words are a bit of a mystery. But for Colour Genie, you'll find excellent books which take you from wiring in the plug to how to get the best from the computer!

Give us a call and we can update you on current titles.

Happy computing!

LOWE
COMPUTERS

Lowe Computers. Lowe Electronics Ltd., Chesterfield Road, Bentley Bridge, Matlock, Derbyshire DE4 5LE
Telephone: (0629) 4057, 4995. Telex: 377482 LOWI FC G

*Microsoft® is a registered trademark of Microsoft Incorporated

CLIPABLE Please send me full Colour Genie details, software list and the address of my nearest specialist Dealer.

Name _____

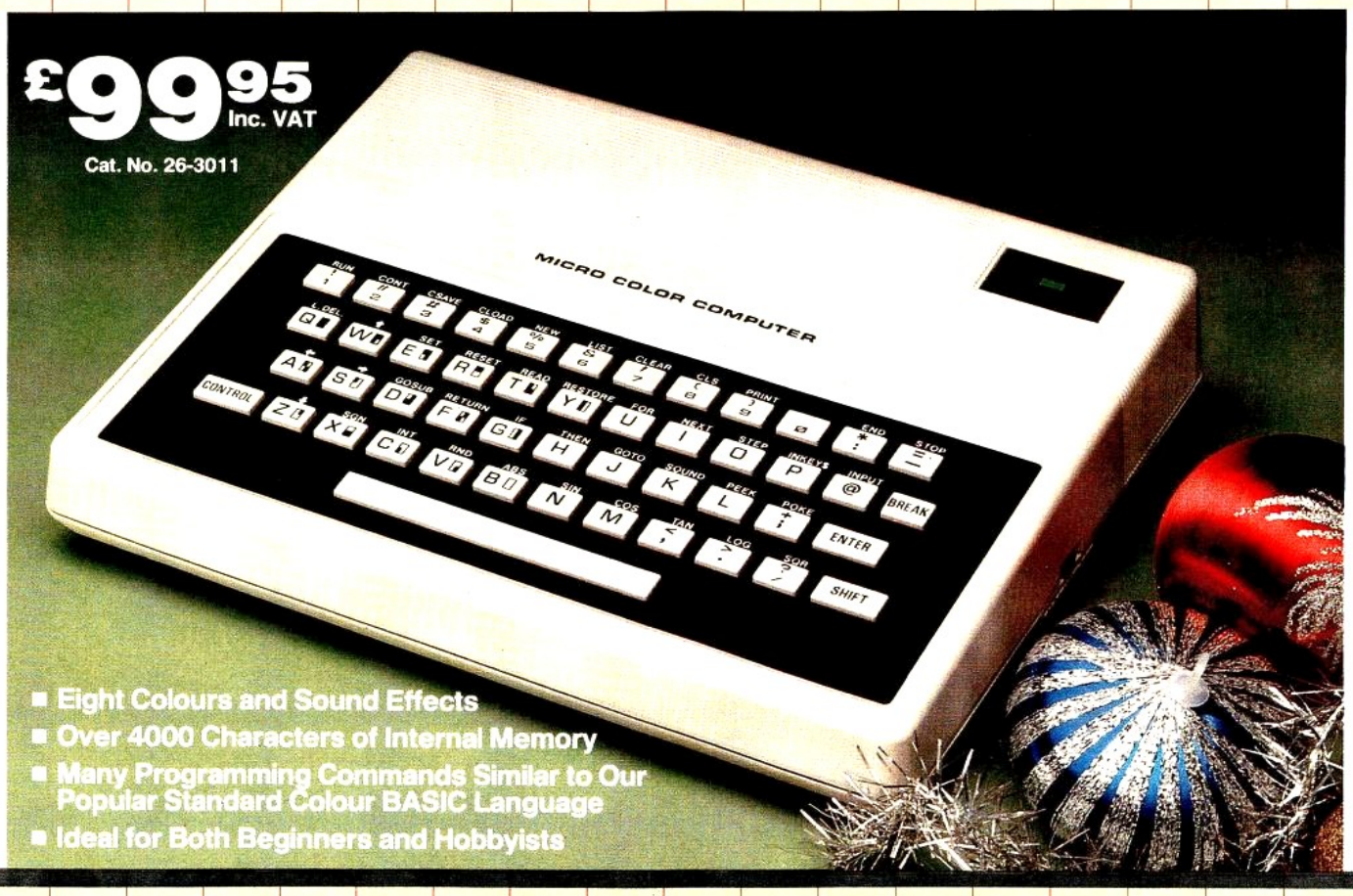
Address _____

Postcode _____

Lowe Computers. Lowe Electronics Ltd. Chesterfield Road. Bentley Bridge. Matlock. Derbyshire DE4 5LE Telephone (0629) 4057 4995

WMSR

The New TRS-80™ Colour Microcomputer Model MC-10



DISCOVER THE WORLD OF COMPUTING WITH THE NEW TRS-80 COLOUR MICROCOMPUTER MODEL MC-10

Low-Cost Versatility. The new TRS-80 Micro Colour Computer is your chance to join the "computer revolution" with a very small investment! Just attach it to your TV, and discover the ease of creating graphics with exciting colours and sound. Or learn to program with the entertaining manual that comes with the MC-10. You can even choose games and personal time-saver programs from our library of ready-to-run MC-10 cassette software.

Compact, Yet Powerful. The MC-10 features an attractive case that measures just 2 x 7 x 8½" and weighs only 29½ ounces. Many advanced features are easily accessed via its 47-key typewriter-style keyboard. Best of all, the MC-10 has real keys - not a flat plastic overlay.

Deluxe Programming Features. Enter complete BASIC commands by pressing just two keys! For graphics, just depress the "Shift" key and the desired graphics character key for colourful displays in seconds. Even save and load programs to and from tape with an optional cassette recorder.

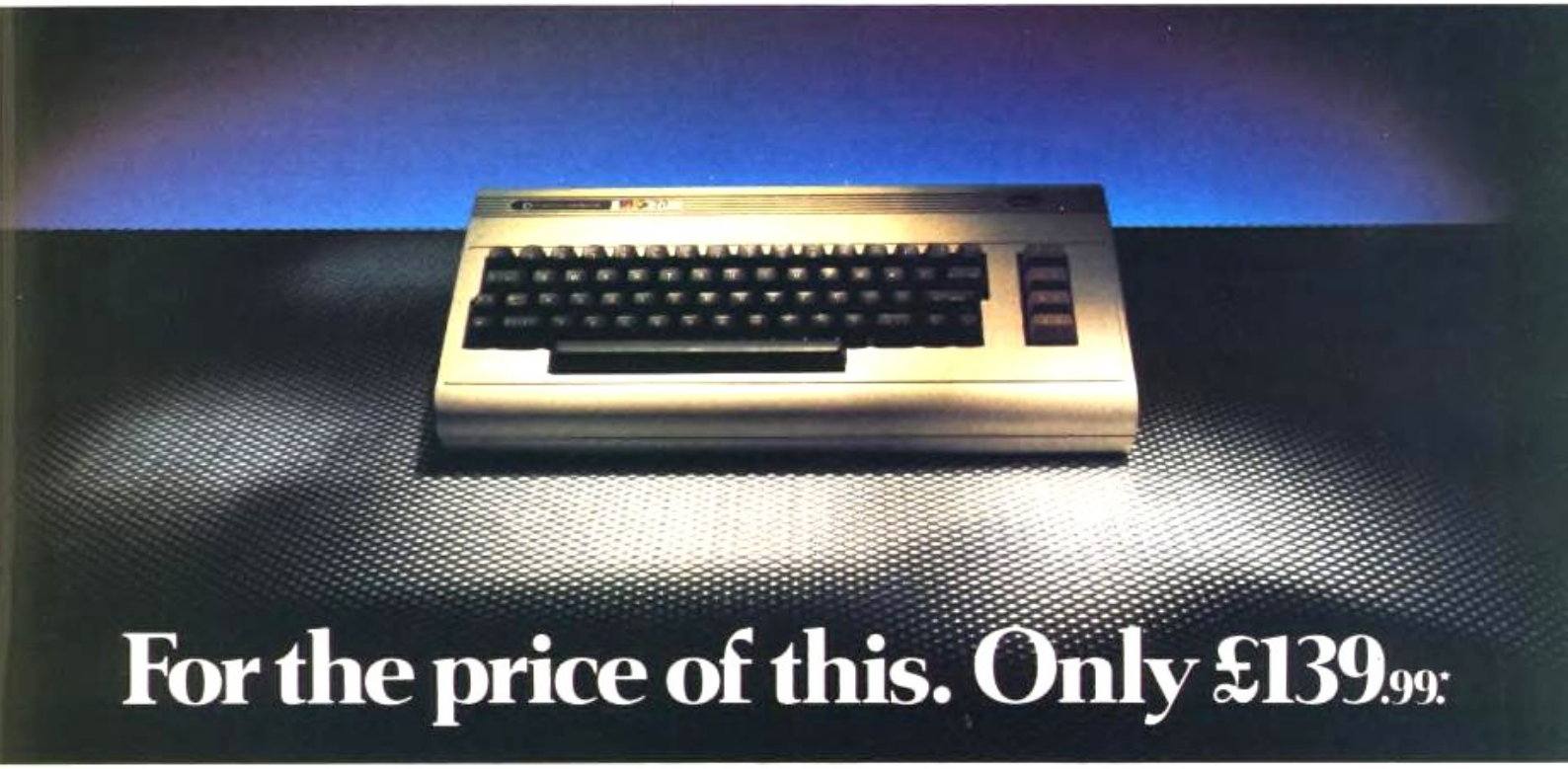
Easy Expansion. Add an extra 16,000 characters of memory with the new 16K RAM Module (Cat. No. 26-3013, £39.95). The MC-10's RS-232C serial interface lets you connect a printer, such as the new TRS-80 TP-10 Thermal Printer which prints both text and Graphics on 4" wide white paper.

See It Today! The TRS-80 Micro Colour Computer MC-10 is at the Tandy store, Computer Centre or participating dealer nearest you!

Tandy

The Biggest Name in Little Computers

Tandy Corporation (Branch UK), Tameway Tower, Bridge Street, Walsall, West Midlands. WS1 1LA



For one month only,* you can get a complete Commodore computer system for the price you'd expect to pay for the VIC 20.

It's a complete computer system: a Commodore VIC 20 computer, a cassette unit, a simple explanation of computer programming–"Introduction to Basic Part 1," plus an exclusive compilation tape of four computer programs, (Blitz, Type-A-Tune, Race and Hoppit).

And, while stocks last, all that can be yours for just £139.99. Which is almost exactly the price you'd normally have to pay for the VIC 20 alone.

There's only a limited number available, so we recommend you visit your nearest VIC 20 stockist as soon as possible.

ALL ABOUT THE VIC 20

They say it's the best home computer in the world, and no wonder! There are educational programs for 5 year olds and up (spelling, physics, arithmetic etc.) Plus music, typing, chess and home accounts. And, of course, all those marvellous arcade games.

You'll soon be exploring new worlds of colour, animation and sound. With a vast choice of programs and unlimited scope for entertainment. All right at your fingertips.

*Or while stocks last. Details correct at time of going to press.

YOU CAN SEE THE VIC 20 AT ALL BRANCHES OF DIXONS AND WALLACE HEATON, AND AT SELECTED BRANCHES OF BOOTS, RUMBELOWS, LASKYS, CURRYS, GREENS, ORBIT, MICRO C, RANK XEROX, WIGFALLS, SPECTRUM, COMET, JOHN LEWIS, WOOLWORTH, REDIFFUSION, CO-OP AND OTHER GOOD RETAILERS.

ALSO AT BRANCHES OF A NATIONAL NETWORK OF COMMODORE COMPUTER DEALERS.

commodore

VIC 20

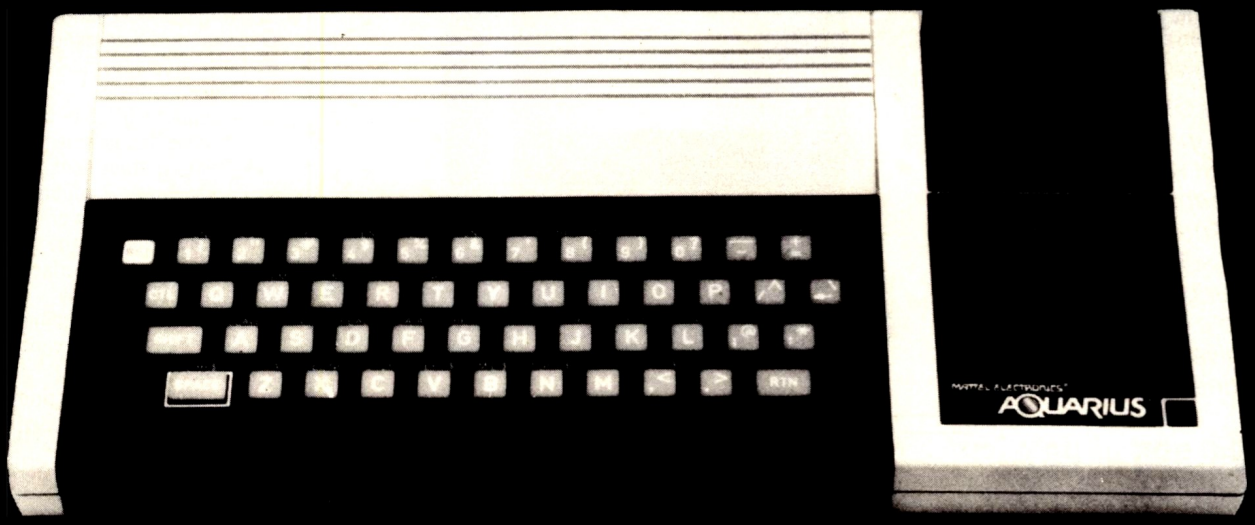
The best home computer in the world.

1984

AQUARIUS

HOME COMPUTER SYSTEM

More software-more hardware!

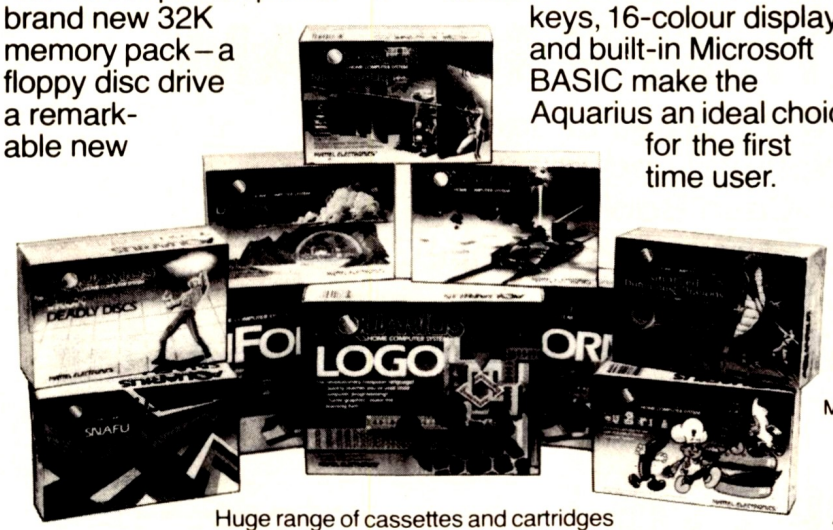


The best value full colour computer on the market – at around £50.

1984 is going to be an exciting year for Aquarius owners!

During the next two months, we are adding to our wide range – an excellent new four colour printer/plotter – a brand new 32K memory pack – a floppy disc drive a remarkable new light pen – PLUS an even wider choice of games, and educational cartridges.

There's no doubt that the Aquarius is the best value full-colour home computer system available in Britain. 49 moving keys, 16-colour display and built-in Microsoft BASIC make the Aquarius an ideal choice for the first time user.



Huge range of cassettes and cartridges with more becoming available each month.

JOIN THE AQUARIUS USERS CLUB

If you are an Aquarius owner – write now for your free membership card. Keep up to date with all the exciting new things that are happening to Aquarius and take advantage of special offers only available to Club Members.

Write to the Aquarius Users Club, 4th Floor, Hyde House, London NW9 6LG.

The instruction manual is one of the clearest ever written and our 'LOGO' cartridge takes you step by step to a full knowledge of computer language.

SEE US AT THE SPRING HARDWARE SHOW AT THE N.E.C. (Hall 3/3A Stand A22)

Manufactured and sold by Radofin Electronics (UK) Ltd., Hyde House, London NW9 6LG.
Telephone: 01-205 0044 Telex: 923624 FIPLC G
Trade enquiries welcome.

Available through many leading retailers — including Harrods — Menzies — Carrefour — Asda — BMOC — MAKRO — Allders

Three c
amn

A rubbish bin for your old
has been.

Yet more money
bol

Believe it or not, computers often suffer from amnesia.

99% start off with large enough memories, but operating functions like text, colour, sound and more particularly high resolution graphics, take large bytes out of them. Leaving very little "useable" memory for programming and games.

Not so the new Oric Atmos 48K.

This is the one home computer that takes these normal working functions in its stride.

Unlike other home computers it uses the highly sophisticated serial attribute handling method used by Viewdata and Teletext, in which the attributes are stored on the screen alongside the data, instead of taking up space in the memory.

Thus the Oric Atmos never offers less than a healthy 37K of useable memory – even when the new colour printer and disc drive unit are attached. (Technical buffs see details overleaf).

So it rivals the performance of the supposedly larger, more expensive Commodore 64K, which unfortunately loses 26K of its "elephantine" memory in high resolution graphics.

It beats its immediate competitors like the Sinclair Spectrum, Dragon 32K, Vic 20 and Atari 600.

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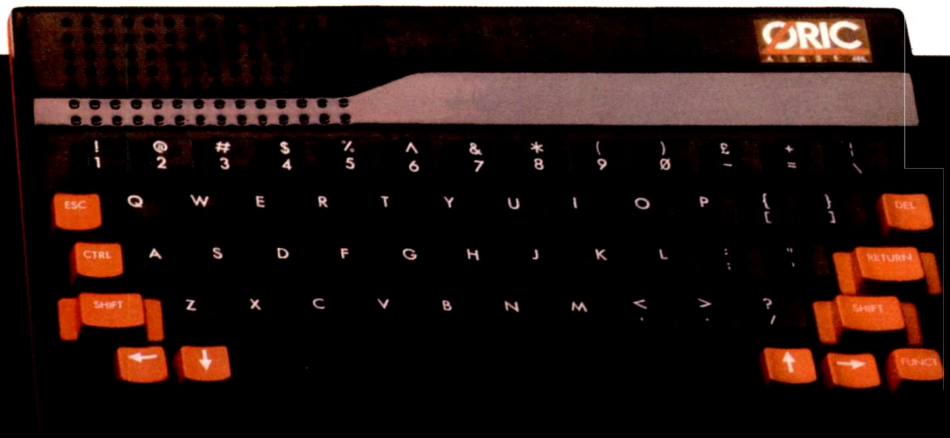


for yet more
ons.

The new Oric Atmos 48K.

It beats the Lynx 48K, which costs over a third more, yet loses 34K.

It even beats the Acorn Electron and the BBC Micro which costs more than twice as much, yet loses 23K in high resolution graphics.

And while this may surprise you, it's totally in keeping with a company recognised in the computer industry for performance and innovation.

Like its predecessor, the Oric-1, the Oric Atmos has the powerful loudspeaker and amplifier unit that prompted "Which Micro" (November issue) to comment... "Its sound facilities have more in common with those of the £400 Beeb, than the rather pathetic beep of the Spectrum. At full volume it can compete with most arcade games..."

Yet the Oric Atmos 48K costs a mere £170, including all the leads and adaptors you need to get it going.

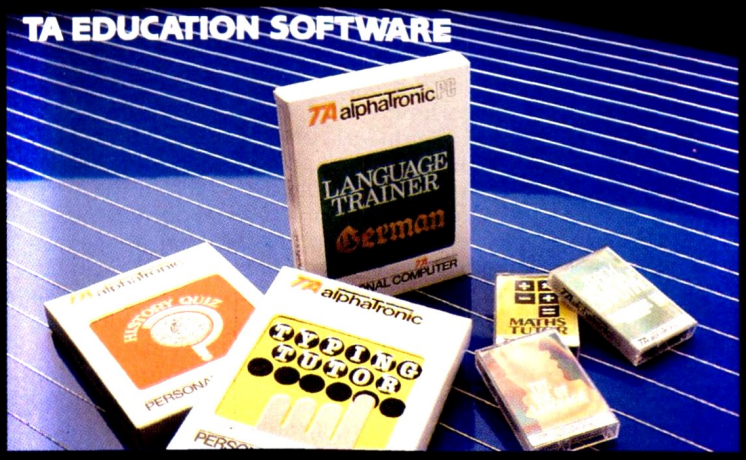
So if you're buying a computer, remember our name. We could save you a fortune on bolt-ons... or wastepaper bins.

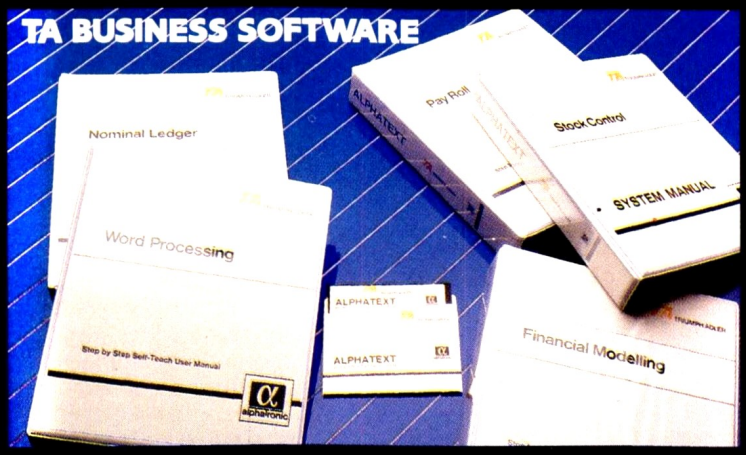
The new Oric Atmos 48K. ORIC

Surrey. KT12 2SD Tel: 09322 42777

TRADE & EDUCATIONAL ENQUIRIES WELCOME

The Alphatronic





The Alphatronic Personal Computer makes playing, learning and working more fun, more fullfilling, more rewarding. But when you put it to work, then it really means business. In fact it's probably the cheapest way to access business programmes through CP/M software.

The games first though — enough for the most ardent player. Some just plug into a socket at the back, with their own 16K Rom module. Others can be played from virtually any cassette recorder. There are arcade games to sharpen reflexes and test imagination. Educational programmes to increase knowledge, plus chess and other traditional games.

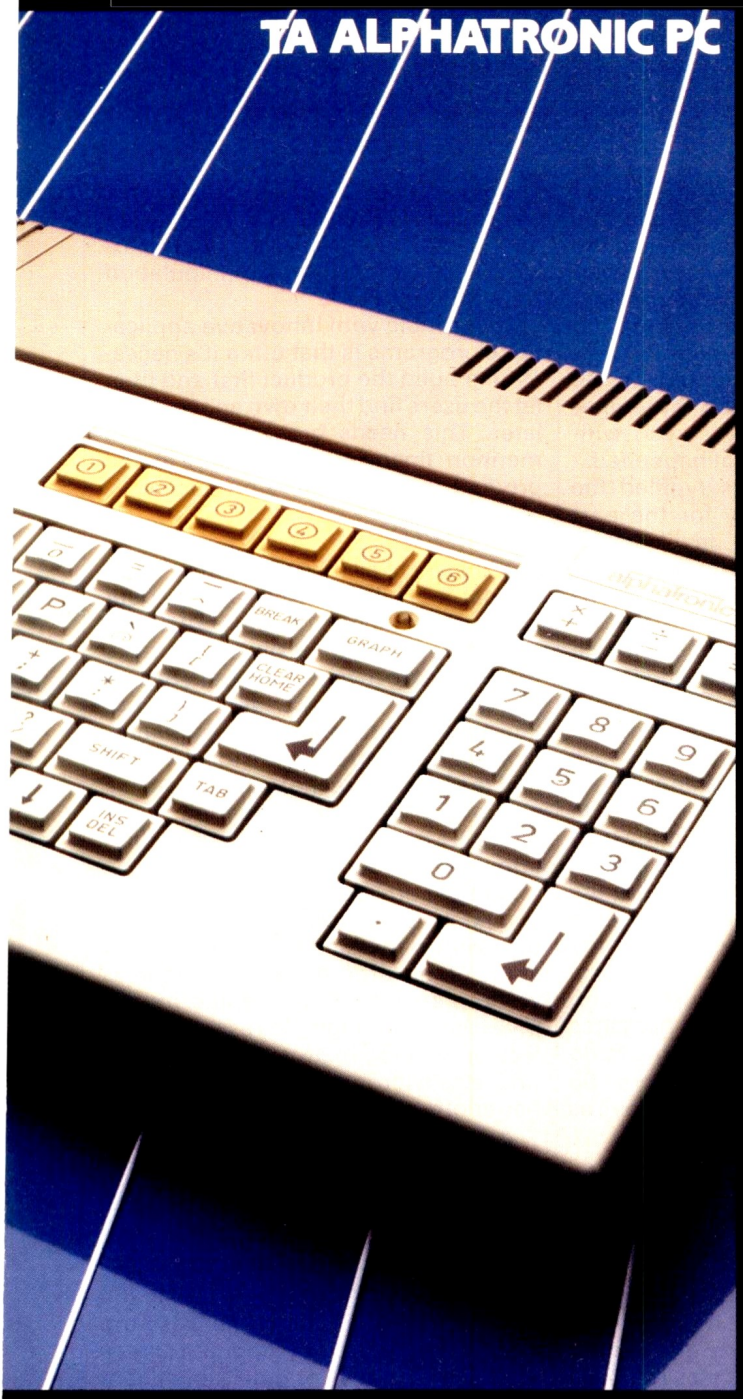
You'll benefit from the learning programs. There are cassette instruction courses on writing programs in BASIC. Other cassettes get you and your family off to a flying start into skills like typing, household budgeting, tax returns and investment management. And of course there's our own instruction and BASIC interpreter manual.

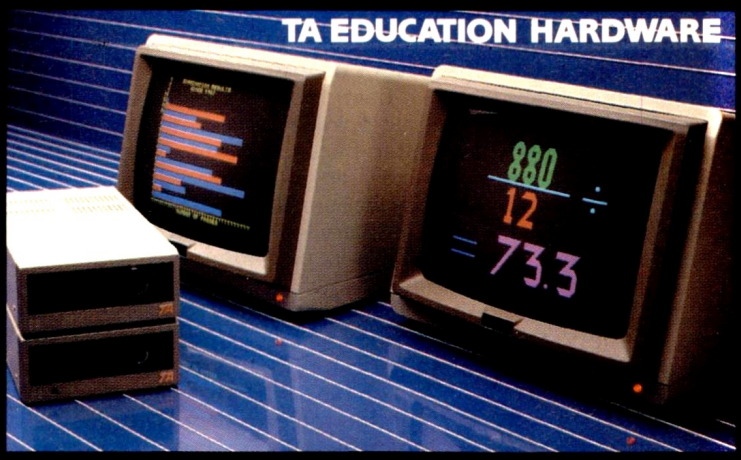
Now to business. The Alphatronic PC is unusual in giving you low-cost access to a complete version of CP/M, the world's most popular operating system for business software. You just connect up one or two floppy disc drives and a printer, then you can run a whole host of new management programs: office word processing, business accounting packages and financial planning — the choice i tremendous.

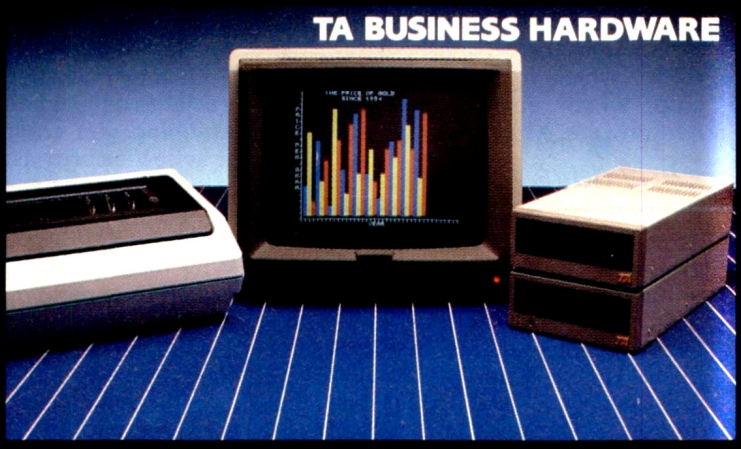
The keyboard is a real delight compared with competitive models. There are very few confusing multi-function keys, and a really professional numeric keypad is included. Six separate keys can be programmed and indexed for special routines. And the full alphanumeric keyboard is just like a modern electronic typewriter.

You may recognise the keyboard, because the

C means business







Alphatronic PC is from Triumph Adler, leading European manufacturers of business machines, who supply offices in 40 countries worldwide.

That means real commitment and continuity in design, engineering and software support. For instance, TA make sure you can get everything you'll need — ribbons, stationery, disks, upgrading peripherals — from just one source.

So you play and learn on the Alphatronic PC, and enjoy good value for money. Or you can really make it work for you. Then you'll really see what it's worth.

For you, your family and your business, get your hands on an Alphatronic PC now.

Please let me know where I can try the Alphatronic PC.

Name: _____

Address: _____

_____

_____

Telephone: _____

TA TRIUMPH-ADLER

Triumph Adler (UK) Limited, 27 Goswell Road, London, EC1M 7AJ.
Telephone: 01-250 1717

The problem with buying a home computer, as you may already have discovered, is there's often very little software to go with it. Or all that is available is games, games and more games.

There's no such problem, however, with the Commodore 64. It has a more extensive range of serious software than any other home computer.

It also has an unusually large (in fact elephantine) 64K memory, as well as every peripheral you're ever likely to need.

Put simply, this means the computer has the capacity to run more interesting, entertaining and complex programs.

You can teach yourself just about any subject you care to mention, even computer programming.

And for the office there are programs like word processing, financial planning, information storage and stock control.

Finally, when you're mentally exhausted, you can even entertain yourself – yes, with games.

When all's said and done, however, we do have to admit that in one respect the Commodore 64 isn't up with the competition. It costs around £229, much less than any comparable machine.

And that's a fact we hope you'll never ever forget.

When you have an enormous memory there's no end to the things you can do.

Please send me further information on: the 64 computer ☐ 64 software ☐ disk drive ☐ cassette unit ☐ printers ☐ monitor ☐

Name (Mr. Mrs. Miss)

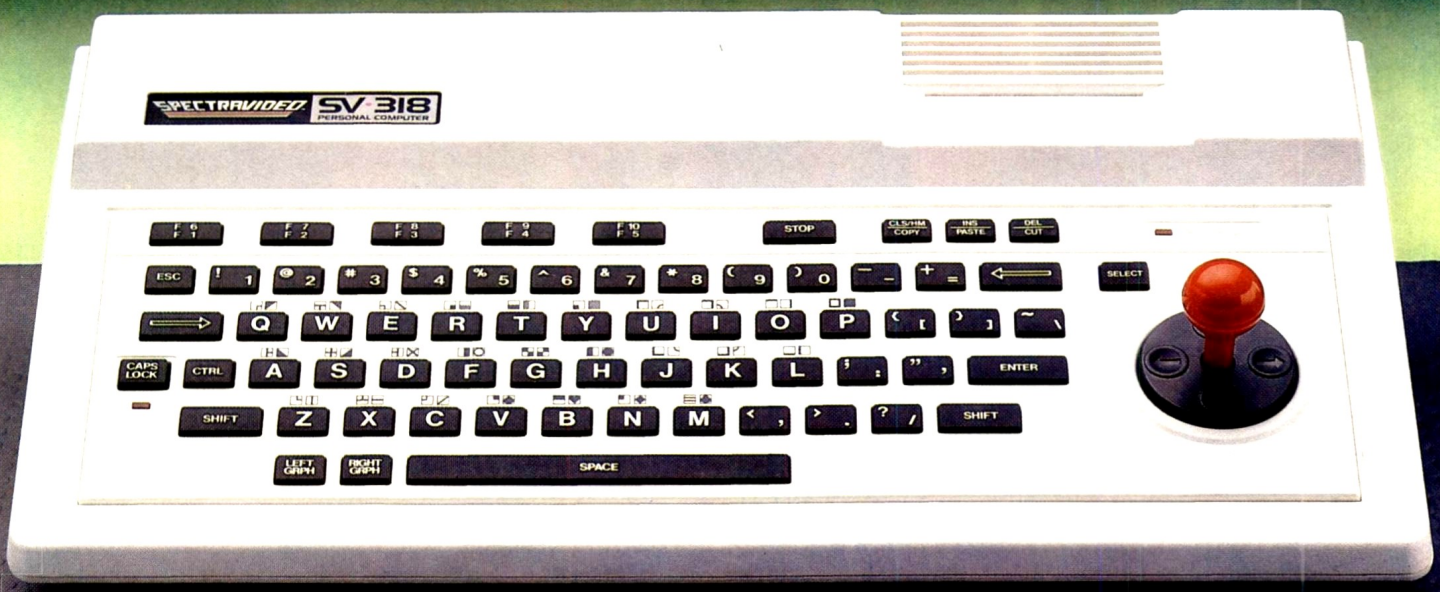
Address

Send to: The Commodore Information Centre, 675 Ajax Avenue, Slough, Berkshire SL1 4BG. Or telephone (0753) 79292.

commodore

BSCOH0384

"Leaves the Atari, Dra
and Lynx



Choosing a home computer is a bit like playing a video game. The more you play, the better you get. So you'd expect people who spend their working life choosing computers to be pretty good at the game. Quick to shoot down a fault. Pleased when they find an improvement.

Recently Which Micro? and What Micro? tested the Spectravideo SV 318. Here's what they had to say:

"Every home computer coming on the market tends to be hailed as revolutionary. For once this really has to be true with the Spectravideo SV 318."

"The first cheap, high performance computer..."

"Double precision numbers . . . are ideal for companies with turnovers under £999,999,999,999.99."

Spectravideo SV 318: **Memory** – 32K ROM expandable to 96K, 32K RAM expandable to 144K: **Keyboard** – calculator type, 71 keys, 10 function keys, built in joy stick/cursor control: **Graphics** – 16 colours, 256 x 192 high resolution graphics, 32 sprites: **Sound** – 3 channels, 8 octaves per channel: **CP/M* compatibility** – over 3000 existing software packages: **Storage** – cassette drive, 256K disc drive capacity: **Suggested retail price** – £186.

Spectravideo SV 328: **Memory** – 48K ROM expandable to 96K, 80K RAM expandable to 144K: **Keyboard** – full word processor type, 87 keys, 10 function keys, built in cursor control: **Graphics** – 16 colours, 256 x 192 high resolution graphics, 32 sprites: **Sound** – 3 channels, 8 octaves per channel: **CP/M* compatibility** – over 3000 existing software packages: **Storage** – cassette drive, 256K disc drive capacity: **Suggested retail price** – £262.

A full range of peripherals are also available.

** Which Micro Hardware Revue – Spectravideo SV-318

*® CP/M is a registered trade mark of Digital Research Inc

gon, Commodore 64 for dead." Which Micro? Dec 83.**

"...a far better job with its keyboard than anybody else using soft keys."

"...most people will notice how easy it is to produce graphics with the Basic."

"This is a BBC class machine."

"As a computer for the enthusiast it is well nigh perfect."

"A good micro for tomorrow."

Obviously, they had more to say. And we think you should have a look at the reports for yourself to prove that we haven't exaggerated their independent opinions.

Fill in the coupon today and we'll mail you the reports as well as a full technical specification brochure in colour of this amazing new personal computer or see the Spectravideo for yourself at most leading computer stockists.

SPECTRAVIDEO™

SV·318 SV·328
PERSONAL COMPUTERS

Spectravideo Ltd, 165 Garth Road, Morden, Surrey SM4 4LM
Telephone: 01-330 0101. Telex: 28704 MMH VANG

To: **Spectravideo Ltd**, 165 Garth Road, Morden, Surrey SM4 4LM

I am interested in Spectravideo computers and peripherals. Please send me the latest reports together with a full technical specification brochure.

Name: _____

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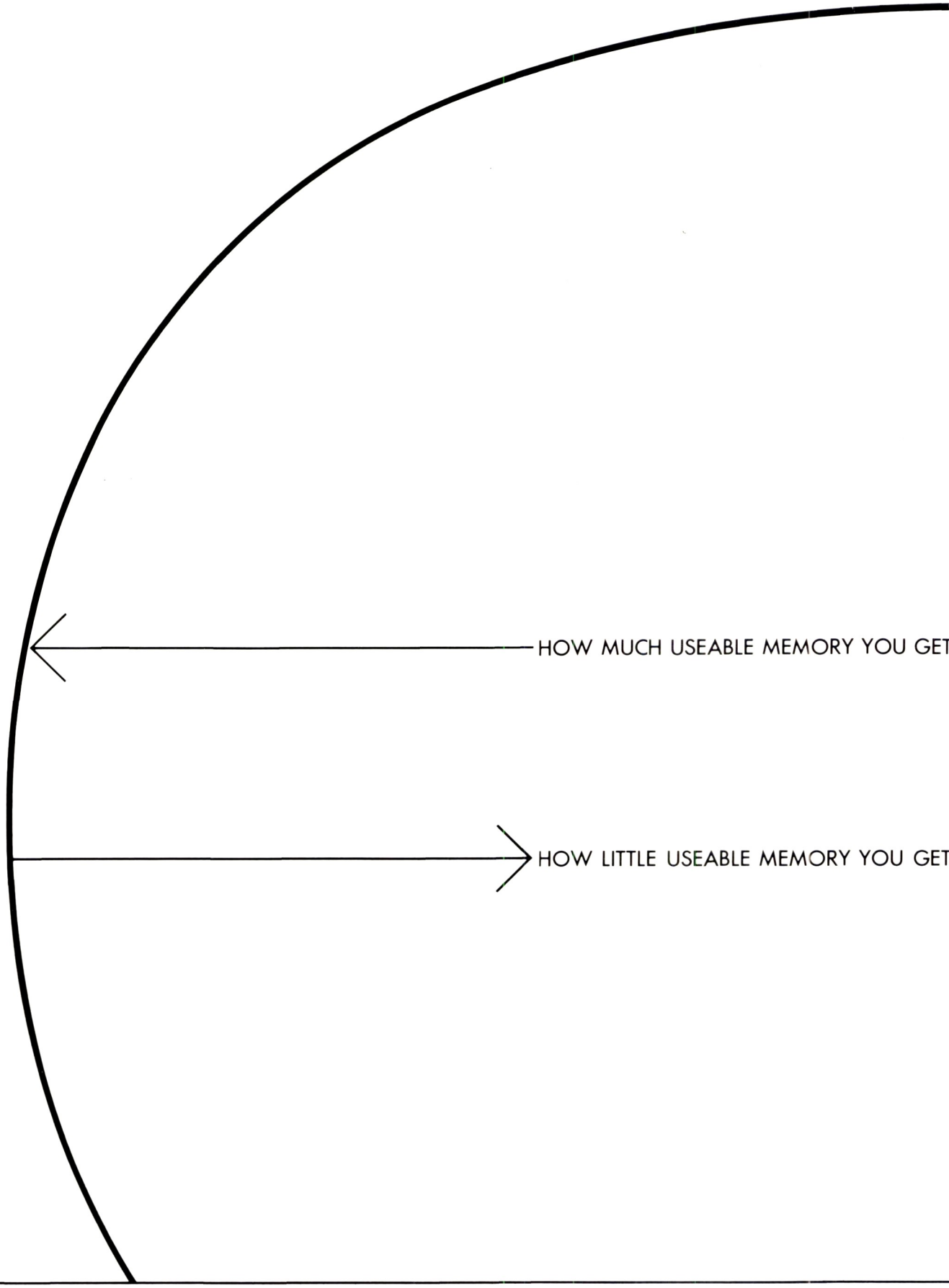


If you saw a computer labelled 32K, 48K or 64K you'd assume it had a large memory. Right?

Wrong. These figures bear little relationship to the actual amount of useable memory left once the computer is performing functions like text, colour, sound and even more importantly, high resolution graphics.

The Commodore, for instance, claims an "elephantine" 64K memory, yet uses up 26K producing high resolution graphics.

Under the same conditions, the Dragon 32K leaves 24K of useable memory, the Lynx 48K just 14K.

And the BBC Micro and Acorn Electron leave the operator a miserly 9K to play with.

However, there is one computer specifically designed to cope with these normal working functions as a matter of course.

The new Oric Atmos 48K.

Why, even when you add peripherals like the new micro disc drive unit and colour printer (see technical details overleaf), its useable memory is never less than a healthy 37K.

Which not only caters for all the standard applications you'd expect from any home computer, but also for advanced

WITH THE NEW ORIC ATMOS.

WITH OTHER HOME COMPUTERS.

programming and very sophisticated games.

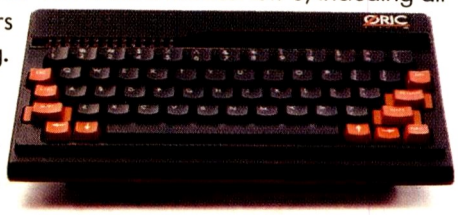
Talking of games, the new Oric Atmos starts off with a major advantage over most new computers, since it takes most of the software already written for the Oric-1.

And like the Oric-1, it has a powerful loudspeaker and amplifier inside its case.

The same unit, in fact, that prompted "Which Micro" (November) to quote... "At full volume this machine can compete with most arcade games. Its sound facilities have more in common with the £400 Beeb, than the rather pathetic beep of the Spectrum..."

Yet the Oric Atmos 48K costs a modest £170, including all the leads and adaptors you need to get it going.

But then what else would you expect from a British Company recognised for offering so much for so little?



The new Oric Atmos 48K. ØRIC

Now we've whetted your appetite, here's something to get your teeth into.

Printer Technical Specifications

Printer/ Plotting system	Ball Point Pen, 4 colour
Plotting speed: (horizontal) (vertical)	52 mm/sec (2.05ips) 73 mm/sec (3.08ips)
Printer Speed	12 characters per second
Resolution	0.2 mm/step (0.00787 inch)
Effective plotting range	96 mm (3.804 inch) x axis, divided into 480 steps. (No limit in y direction)
Characters per line	80 or 40 text mode (determined by software in graphics mode)
Characters per line	INT (480/n+1) *6) for 0=n=15
Accuracy (repetition) (movement) (distance)	0.2 mm max 0.3 mm max 0.5% max (x–axis) 1% (y–axis)
Pen life	250 metres (825 feet)
Parallel interface	8–bit parallel Uses STROBE and ACKNOWLEDGE
Temperature range storage	18.3 to 35°C (65 to 96°F) –40 to 71°C (.40 to 160°F)
Humidity range	10% to 80% relative non-condensing
Power supply	Switching power supply input 100–120 VAC 200–240 VAC
Dimensions	10¾" wide 6⅞" deep 2½" high

Atmos Technical Specifications

CPU	6502 A
Memory	Choice of 16K or 48K RAM
Memory (48K Model)	Minimum 48K RAM, max 64: 16K ROM external control signals allow use of full 64K RAM or maybe used externally to increase ROM/RAM
Language	Extended Microsoft basic
Keyboard	Typewriter style and pitch, 57 keys, standard computer layout, additional cursor control keys, autorepeat facility, tactile and acoustic feedback
Display	Output for B&W or colour TV, RGB output for colour monitor.
Text format	40 line x 28 rows
Character set	Similar to Teletext format, standard ASCII double height, flashing, 80 user definable characters
Graphics	240 x 200, 8 colours
Graphic Facilities	Points, lines, circles
Sound	Internal loudspeaker and amplifier. 3-Channel sound synthesiser envelope control, amplitude control 8 octaves, noise channel
Storage	Most cassette recorders via DIN socket 300 or 2400 BAUD. Disc Drive.
Interface	Centronics, expansion port, Hi-fi, RGB Monitor, UHF TV, cassette recorder
Other	Warm reset to regain control without clearing program or data

Micro Disc Technical Specifications

Formatted Capacity	160K bytes per side (double density as standard)
No. of Tracks	40 (80 available as option at a future date)
No. of Sectors	16
Bytes per Sector	256
Transfer Rate	250K Bits/Sec

Supports up to 599 files per side, four drives single or double sided, 40 or 80 track. User definable configuration allows mixing of drive types including 5¼" (five and a quarter inch)
Extensive wild card facilities
Copy allows merging of basic and machine code files

Utilities

The Utilities are as follows:

1. Backup	Copy a whole disc
2. Copy	Copy a file to another
3. Del	Delete a file allowing wildcards
4. Dir	Display directory listing
5. Drv	Set the default drive number
6. Format	Format and initialise a disc
7. Load	Load a file (code data or basic)
8. Protect	Change protect status of file
9. Recall	Recall a basic array from a file
10. Ren	Rename a file
11. Save	Save a file (code, data or basic)
12. Store	Store a basic array as a data file
13. Sys	Change system configuration

Prices and data correct at time of going to press.
Specifications on the above models may change without notice.

Available at Dixons, Laskys, Comet, Wigfalls, Rumbelows and all good computer stockists.

ØRIC

The SV·328 just goes on growing...

With sophisticated 3-channel ADSR sound, high resolution sprite graphics and a rapidly expanding library of software, the Spectravideo SV 328 is all you'd expect in a great games machine.

A slick word processor-style keyboard, CP/M* compatibility and massive RAM (expandable to full 144K) puts it in the business league.

And for keen programmers, the easy-to-use and space saving extended BASIC gives total control of all standard functions.

There's room to grow too – with a complete range of peripherals already available, including some of the best joysticks in the business.

At £262 the SV328 is great value for money!

Spectravideo SV 328: Memory – 32K ROM expandable to 96K, 80K on board RAM expandable to 144K: **Keyboard** – full word processor type, 87 keys, 10 function keys, built in cursor control: **Graphics** – 16 colours, 256 × 192 high resolution graphics, 32 sprites: **Sound** – 3 channels, 8 octaves per channel: **CP/M* compatibility** – to over 3000 existing software packages: **Storage** – cassette drive, 256K disk drive capacity. **Suggested retail price** – £262.

Spectravideo SV 318: Suggested retail price – £186.

Spectravideo Peripherals: Cassette Drive: Disk Drive – single: Disk Drive – double: Disk Drive – full Business Pack: Mini Expander: Super Expander: Monitor: Printer with Interface Card: Centronics Interface: RS 232 Interface: 16K RAM Pack: 64K RAM Pack: 80 Column Card: Coleco Adaptor: Quick Shot Joysticks.

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PCW6/84

Maximising

The British computer industry is small when judged by international standards. Two large American companies control 90% of world markets. They can do this because their products represent the standard by which others are judged. When these standards are accepted by the marketplace they have the effect of stabilising the technology. Thus CP/M is accepted as the industry standard operating system for 8 bit processors, and subsequent computer development has employed this standard, with the dual effect of making both man and machine portable. Operators can use different computers, with CP/M, and software can be switched from machine to machine. For the end user the emergence of

technology

these standards is critical because they allow him to experiment with the technology without risk of entering blind alleys where systems and products disappear. In order to avoid this situation Memotech has employed these standards within the MTX Series.

In the UK there has been such rapid development in microsystems that in many cases users have been seduced by the technology rather than the standards they should be following. In educational and business applications the need for continuity is obvious. This is accentuated by the development of database technology, where very large information files are accumulated, the primary expense being the input of data. Companies and schools will not relish the idea of trying to rescue data when the standard 32 bit machines appear in two years time.

There has been a tendency for manufacturers to launch machines which are still on the drawing board, and for which no software standards exist. CP/M 80, the industry standard micro operating system, supports tens of thousands of commercially available software packages. IBM take the view that things should be done properly and *then* released to the user. This is a well tried and clearly well tested premise which Memotech has implemented in the MTX series.

The MTX Series begins with the MTX500, which costs £275.00 including VAT. The MTX512, illustrated below, costs £315.00 including VAT, has 64K of User RAM plus 16K of dedicated Video RAM, and comes with extended BASIC, a powerful assembler/disassembler, Front Panel machine level editor/monitor, and Noddy, a new text and graphics processing language.

Also included in the series, and available now, are the DMX80 printer at £295.00 and the CMX and MMX monitors.

MEMOTECH

For further information, full technical specification and prices write to:
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FREEPOST Witney, Oxon. OX8 6BR.

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And with his help you may just escape from the 3-D horrors of the 1,000-chamber maze. DRAGON CAVES is one of over 130 different titles in the free colour catalogue for Sharp's MZ 700 series computer.

Software for the MZ 700 series ranges from the

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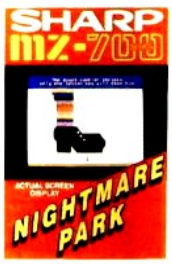

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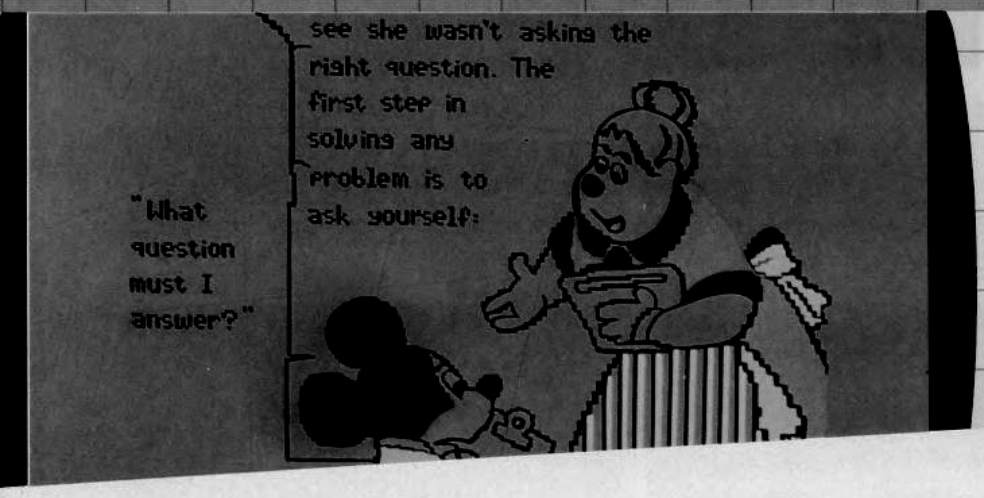

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£159.95 **Inc. VAT**

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Who Is The Colour Computer For? It's ideal for anybody who wants to enjoy video games in a system that can be used for many other household, business and educational tasks. It's great for beginners who want a computer that's easy to learn on - but not limiting - and it's perfect for hobbyists who want a full-features system with the opportunity for advanced graphics and programming expansion.

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MTX512
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The MTX512 comes with 64K RAM, expandable to 512K. Add to this another 16K VideoRAM dedicated solely to handling the screen memory, and you've got 80K. But how much user RAM is left when you're running high resolution graphics programs? Unlike other machines, the answer is still 64K, because the MTX512 uses the 16K VideoRAM plus a second processor – the Texas TMS9929A – to take care of screen graphics. The main processor used in the MTX512 is the Zilog Z80A, which gives the MTX Series CP/M compatibility – CP/M was written around the Zilog Series. And the Z80A inside the 512 operates at 4MHz.

Expansion is no problem with the MTX Series, because it is designed as an interlocking system – from the MTX512 up to the powerful Memotech Silicon Disc Systems.

MEMOTECH MTX512 MAJOR FEATURES

STANDARD I/O PORTS
- Variable rate cassette port (up to 2400 baud)
- Two joystick ports using Atari configuration
- Centronics-type parallel printer port
- ROM cartridge port
- Uncommitted parallel input/output port
- Internal ROM board port
- Hi-Fi output port
- 4-channel sound through TV speaker
- PAL composite video colour Monitor port

THE RS232 COMMUNICATIONS BOARD
(required for disc expansions)
- Two independent RS232 ports
- 60-way Disc Drive Bus supporting up to four 5.25 and/or 8 inch floppy disc drives, Memotech Silicon Discs, and Hard Discs

USER RAM
- Expandable to 512K in increments of 64, 128, or 256K

24K OF ROM which includes:
- MTX BASIC
- Noddy, a simple, text-handling language
- A powerful Assembler/Dissassembler – sections of machine code can be created and run by calling the Assembler from within BASIC
- The sophisticated Front Panel, which displays the contents of all registers (including the F flag register) and pointers during program execution
- All four languages can be used interactively with each other, and with the user

ROM EXPANSIONS - up to 72K
- MTX NewWord, a 32K word processing package
- Hisoft PASCAL, written specially for the MTX Series

THE KEYBOARD
- Full size, 79-key, full-stroke professional quality keyboard incorporating:
- Main Block with typewriter-style layout
- A separate 12-key numeric/editor keypad
- Eight programmable function keys (16 with shift)

GRAPHICS FACILITIES

HI-RES GRAPHICS MODE
- 256 × 192 pixel resolution plus
- 32 × 24 Text in 16 foreground and background colours
- All 16 colours (i.e. 15 colours plus transparent) are available on the screen together
- 32 user-definable easily controllable sprites
- 128 separate GENPAT statements providing a huge range of user-defined characters

TEXT MODE
- Text resolution is 40 × 24 characters plus
- 128 user-defined characters
- Eight user-definable virtual screens or "windows"

SINGLE 5.25" DISC DRIVE – £399.00 inc VAT

Comprising one Qume double-sided, double-density 500K drive, plus the Memotech Floppy Disc Controller Board, with power supply, expansion sockets, and sturdy aluminium case.

Single Disc System Software: MTX Single Disc BASIC extensions on ROM, plus Renumber, 40 Column Text and Graphics Screen, Binary to Hex to Decimal Converter, Data save and load plus five games.

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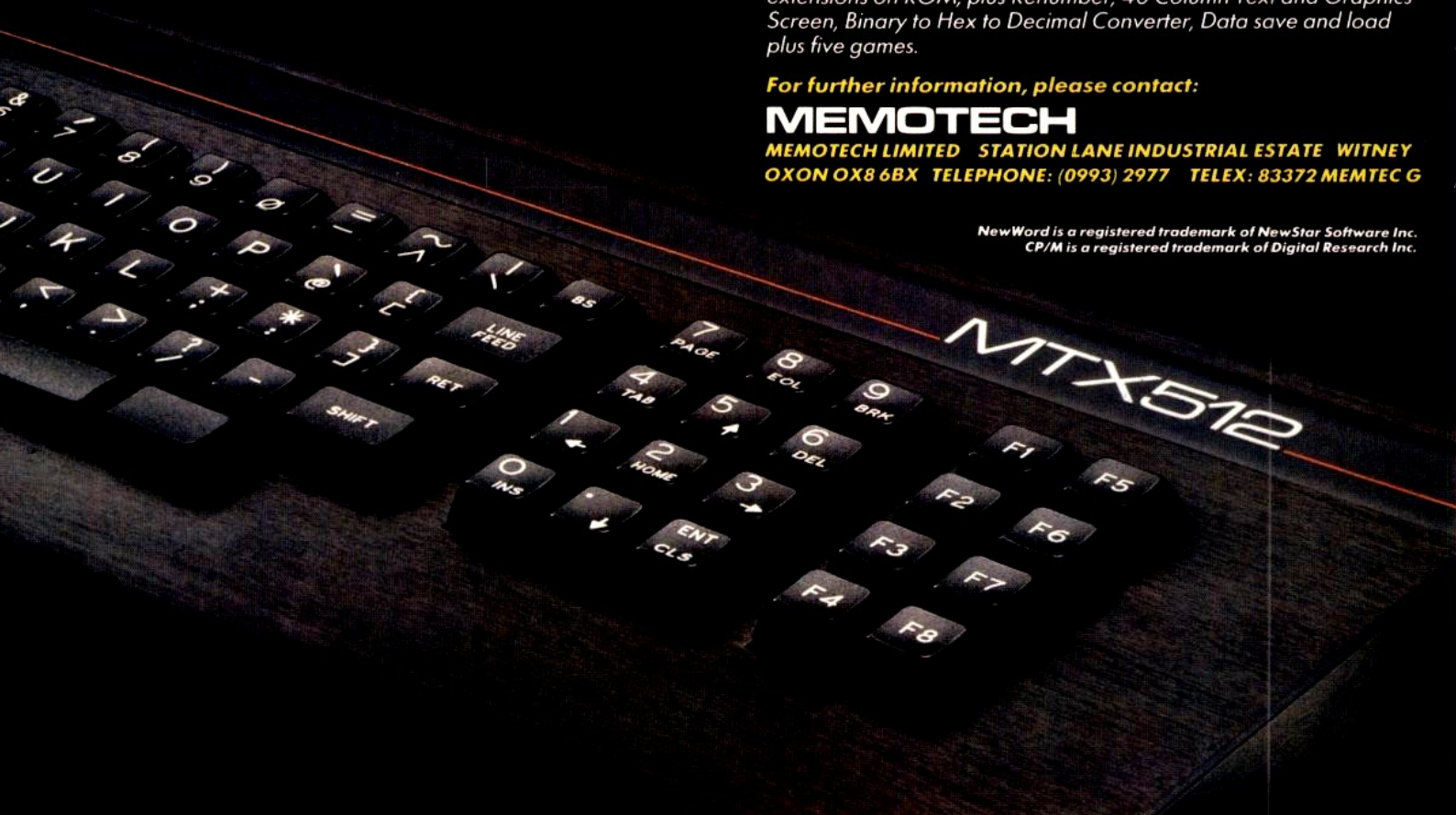
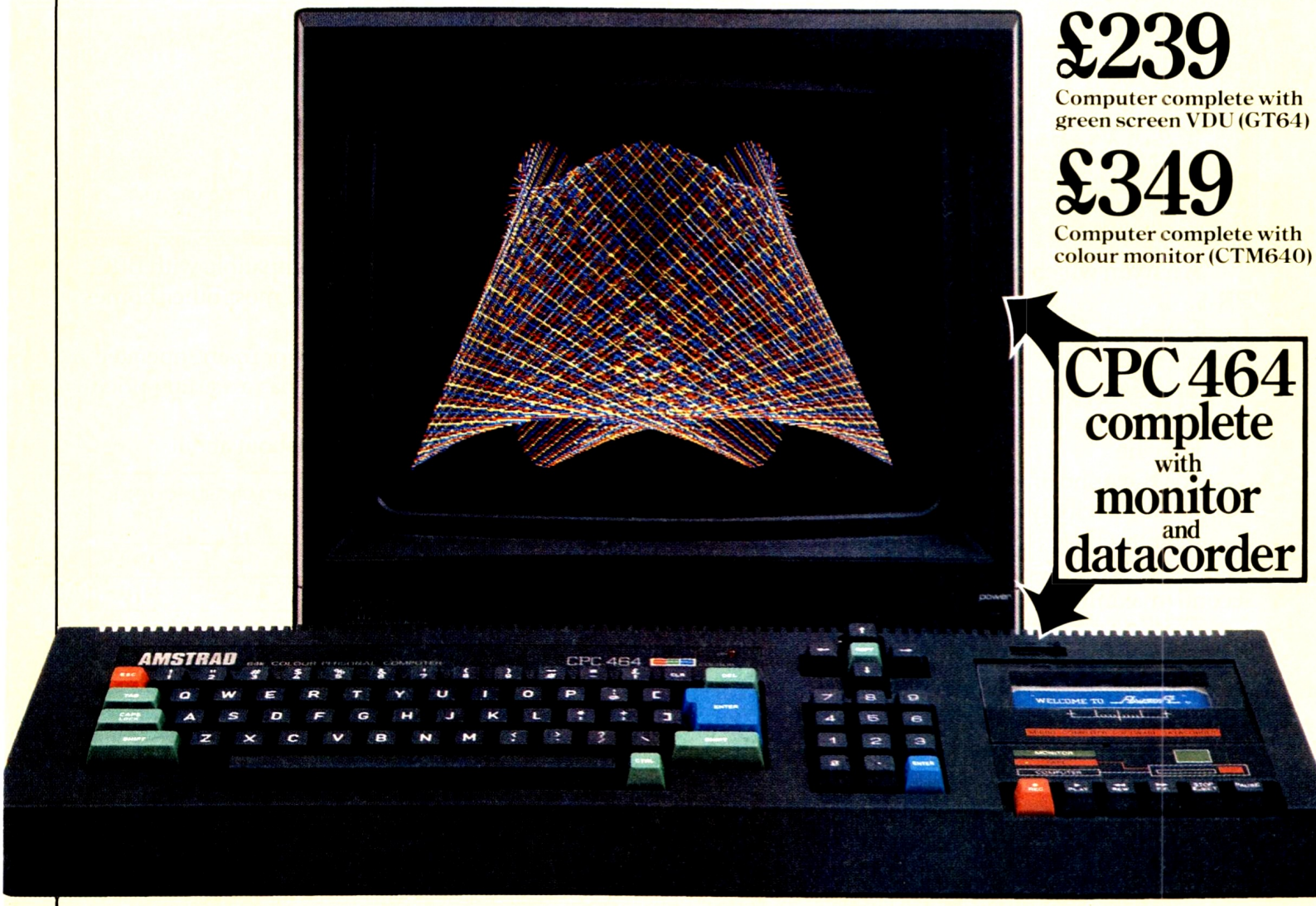


The reason our new computer comes with its own monitor is perfectly clear.



£239
Computer complete with green screen VDU (GT64)

£349
Computer complete with colour monitor (CTM640)

CPC 464 complete with monitor and datacorder

CPC464 green screen VDU (GT64)

The new CPC464 comes complete with its own colour monitor or green screen VDU for obvious reasons.

Connect as directly as possible to the electronics that control the screen display and you get the best possible performance.

The monitor drives each colour on the screen directly from the computer. So there's no unwanted circuitry in the way to distort the picture.

It's clear and steady. Much better than a micro/colour TV combination. And there are no tuning problems, either.

Complete, ready-to-go system.

The CPC464 is unique at the price. No other computer system offers you so much for so little.

64K of RAM (over 42K available to BASIC), 32K of ROM, colour monitor or VDU, built-in cassette data recorder, typewriter style keyboard, numeric keypad and a very fast extended BASIC.

Green screen VDU.

This purpose designed visual display system has an 80 column text display. Text and numerical data are bright, sharp and easily read at a glance. (Invaluable for word processing, accounting, budgeting and developing programs).

Green screen versions of the CPC464 can be used with a colour TV by connecting the optional power supply and modulator MP-1.

Amsoft. Wide range of software.

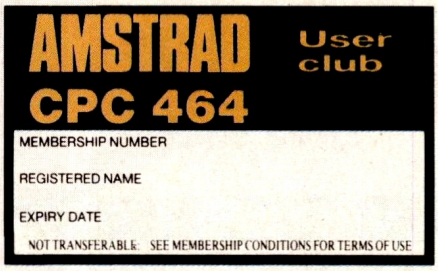
A rapidly expanding range of programs is already available. The high quality software takes full advantage of the CPC464's high specification and speedloading capability. Which means even complex programs can be loaded quickly.

Arcade games, educational programs and business applications are all designed to utilise the CPC464's impressive graphics, sound and processing abilities.

Amstrad. User Club.

Whether you're interested in serious commercial applications or you're a games fanatic, you'll want to join the Club.

Members enjoy immediate benefits like the privilege card, Club binder, regular magazine, competitions for valuable prizes and contact with other Amstrad users.

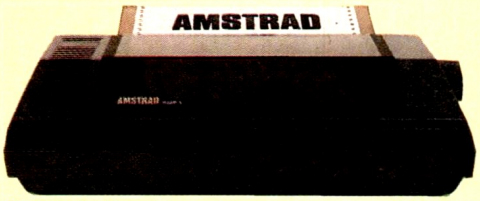


CPC464. Unlimited scope for expansion.

At Amstrad, we look to the future. That's why there's a built-in parallel printer interface.

A low cost optional disk drive system including CP/M* and LOGO. A joystick port. And the virtually unlimited potential of the Z80 data bus with sideways ROM support.

Optional disk drive DDI-1 including interface CP/M* and LOGO £199.95



Optional 80 column dot matrix printer DMP-1. Offers high performance computerised text processing for only £199.95.

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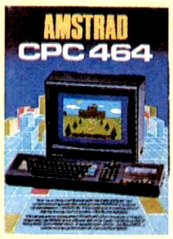

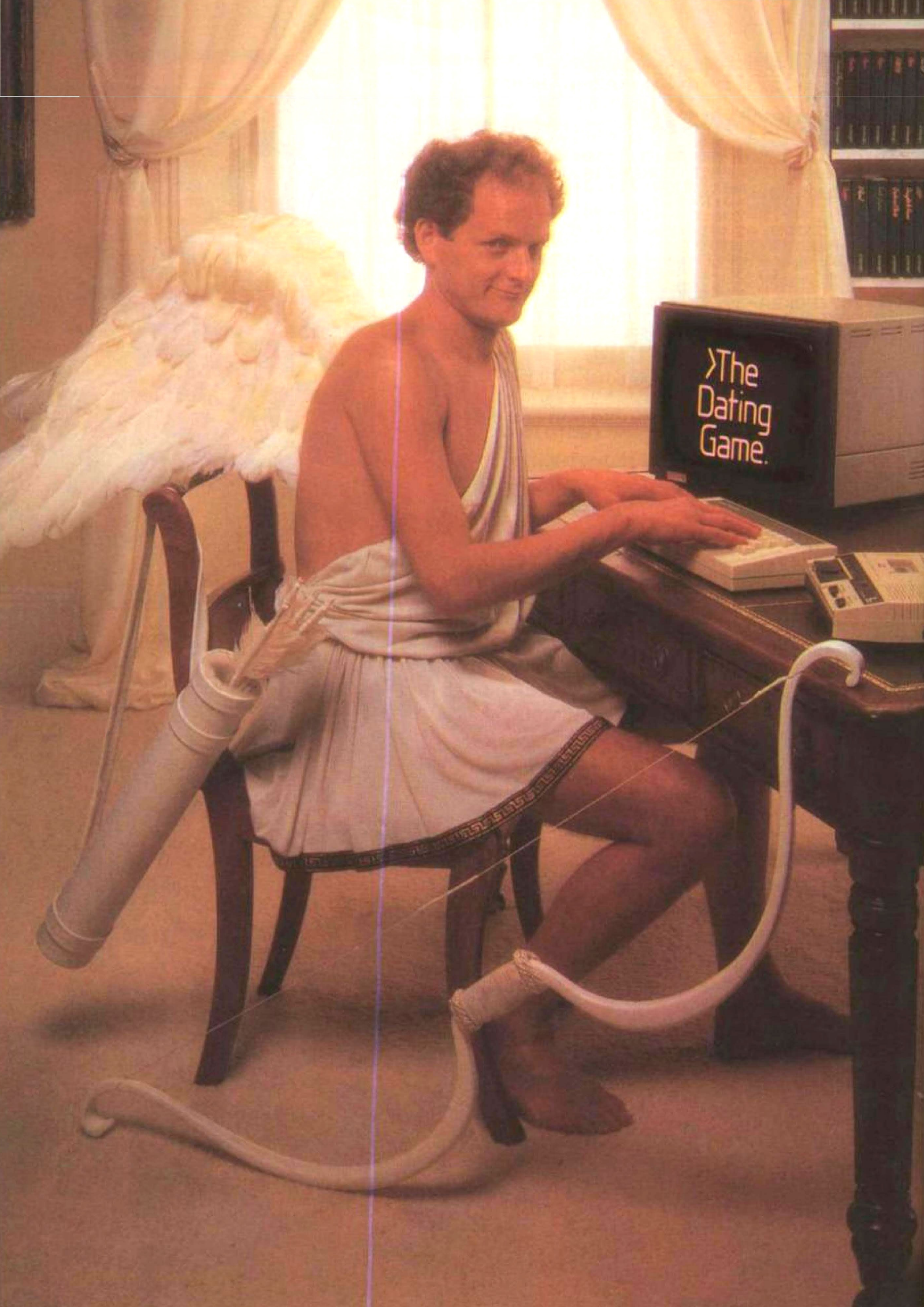
>The
Dating
Game.

The Electron has added even more strings to its bow.

The list of top quality software for the Acorn Electron is growing all the time.

As you can see, there's already an outstanding selection of exciting programs covering everything from monsters to music and murder to marriage guidance.

And ultimately, the Electron will enjoy a range of software as comprehensive as that of its illustrious big brother, the much-acclaimed BBC Micro.

You'll find all the programs featured here at your local Acorn stockist. (To find out where that is, simply call 01-200 0200.)

Alternatively, you can send off for the Electron catalogue and order through the post by writing to Acornsoft, c/o Vector Marketing, Denington Estate, Wellingborough, Northants NN8 2RL. Tel: 0933 79300.

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ACORNSOFT

The new Mitsubis

For those in the know

Anyone conversant with home computers will know precisely why MSX was worth waiting for.

The sheer proliferation of computer and software systems flooding the market loudly underlined the need for a unified standard.

So the major companies jointly developed a single computer and software system. The result – MSX – the format that will be standard for all time.

And those in the know will not be surprised that Mitsubishi are in the vanguard of the MSX movement. For, with the F-series, Mitsubishi offers everything that MSX is and more.

GRAPHICS

Maximum resolution of 256 x 192 pixels with all 16 colours available on the screen at the same time. 32 sprites in two sizes and two magnifications allowing easy creation of '3D' graphics. 255 pre-defined characters all of which can be used as straight text or easily mixed with graphics.

SOUND

Three independent channels which can be output through the TV loudspeakers at any volume, individually or simultaneously, at any of the available 8 octaves. All three channels can use the 'noise' generator for stunning sound effects.

KEYBOARD

73 moving keys, ergonomically designed for many hours of fatigue free use. Large cursor control keys which are excellent for both programme editing and game playing. 5 function keys giving 10 pre-defined functions which can easily be redefined from 'BASIC' using the 'KEY' command.

BASIC

MSX BASIC is possibly the most comprehensive version of the original language. There is a complete set of commands for creating graphics and sounds, manipulating text and moving sprites. In addition to this there are 'built-in' interrupt routines for detecting sprite collisions, function key selections and joy-stick fire buttons.

EXPANSION

The Mitsubishi 64k ML-F80 and 32k ML-F48 are both equipped with 2 cartridge ports, 2 joy-stick ports and a centronics compatible parallel interface. It is through these devices that the MSX system can be expanded for use with disc-drives, printers, serial interfaces, modems and other peripherals.

SOFTWARE ON CASSETTE

The MSX system can load and save data onto cassette at 1200 or 2400 baud and unlike certain other home computers, the Mitsubishi F-series can be used with a normal domestic tape recorder for this purpose.

When you put all of these features together, with the knowledge that Mitsubishi is the largest manufacturer of Mainframe computers in Japan, those in the know will immediately recognise the true potential of the Mitsubishi F-series.

i MSX Computers

For those who aren't

The Mitsubishi MSX family computer is everything you wanted to know about computers, but didn't know who to ask.

It's friendly, it's fun and so simple, a grown man can use it. Yet so versatile even his computer-versed children would be hard-stretched to over-tax it.

It operates with any colour TV set. Just plug it in, and the full power of the computer is instantly at your fingertips.

FOR FATHER

The Mitsubishi MSX can do many things, from keeping a simple check on the bank balance to running a complete business with customer account files, stock control programmes and word processing. It is just as much at home keeping control of your record or stamp collection or playing 'strategy' games such as chess, othello or contract bridge.

FOR MOTHER

There is the opportunity to store recipes and other household information or keeping record of the children's progress at school. Household accounts can also be recorded so that savings can be planned for holidays and other seasonal expenses.

FOR THE CHILDREN

There is education, particularly computer education. In a world where computer literacy is now of foremost importance, MSX offers a broad base of educational software. With simple programmes for the very young through to complex programmes for older students like language learning.

Also, the graphics system of the Mitsubishi computer ensures that the MSX versions of your favourite games are reproduced with incredible speed and accuracy.

Undoubtedly, MSX is the format for the future, and will become the byword for computer education and entertainment.

And you can be secure in the knowledge that regardless of future developments, any investments made in MSX hardware, software and peripherals today will always be compatable with the Mitsubishi F-series.

So if you've waited until now to buy a computer, you couldn't have timed it more perfectly. Get to know one today.

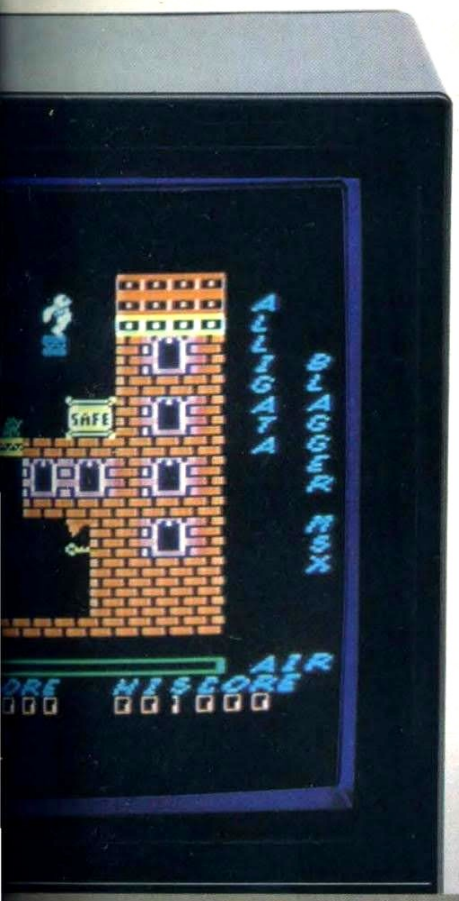
MITSUBISHI COMPUTERS

Mitsubishi Electric (UK) Ltd., Hertford Place, Denham Way, Rickmansworth, Herts WD3 2BJ. Tel: 0923 770000.

SPECIFICATIONS

CPU:
Z80A (3.6 MHz)
Memory:
ROM: 32 KB
RAM: 64 KB (F80)
RAM: 32 KB (F48)
Video Ram: 16 KB
Screen Displays:
*Text Mode:
40 columns x24 lines
*Graphics:
256 x 192 pixels
Colours: 16 (15+transparent)
Sprites: 32
Output: RF, Composite Video
Keyboard:
73 moving-key keyboard
5 function keys
Cursor control keys
Special keys for screen editing
Sound:
8 octaves
3 channels for sound or 'noise'
Output by TV sound or External Audio Amplifier
Cassette Interface:
1200-2400 baud
Motor controlled by CPU
Parallel Interface:
Centronics
Joy-Stick:
2 x 9 pin connectors
Rom-Cartridge:
2 x 50 pin connector

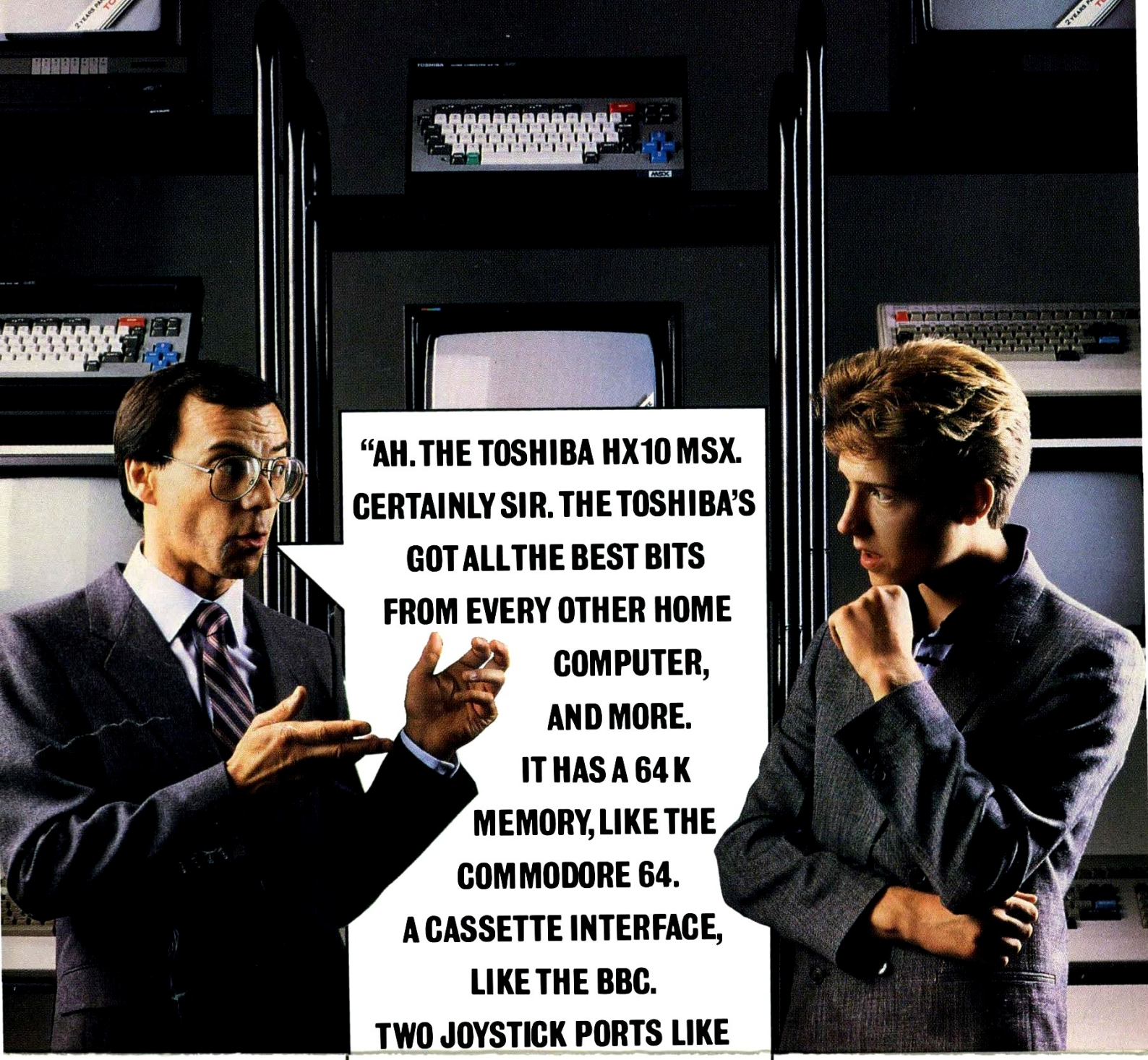
*Subject to Scan of Monitor



ML-F80

ML-F48

MSX



The Toshiba HX10 ex-
ends even further.

You can swap programs,
ames, cassettes, even
ur peripherals.

Like joysticks, disk
ives, 4 colour plotter/
inter that takes A4, and
high-speed dot matrix
inter. And they are all
ompatible with every
her MSX computer.

Which all goes to make
SX the system for the
ture.

So if you want a home

**OTHER NON-MSX COMPUTER.
AND THE TOSHIBA USES
MICROSOFT EXTENDED BASIC,
WHICH IS COMPATIBLE WITH
EVERY OTHER MSX MACHINE,
SO YOU CAN GUARANTEE
THE SOFTWARE AND THE HX10
WILL BE AROUND
FOR MANY YEARS TO COME."**

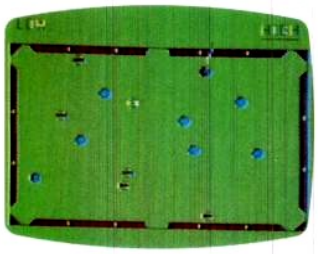
computer that won't be obsolete in a few years, buy an MSX.

And, if you want one of the best-selling MSX computers in Japan, buy the HX10.

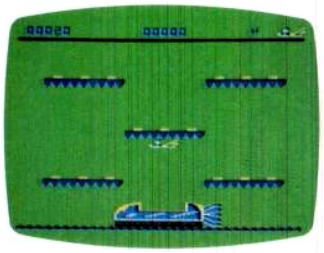
TOSHIBA MSX

FOR MORE INFORMATION ON THE TOSHIBA HX10 CONTACT TOSHIBA (UK) LTD., TOSHIBA HOUSE. FRIMLEY ROAD, FRIMLEY, SURREY GU16 5JJ. TEL: (0276) 681691.

Tandy® Learn And Save With The Tandy TRS-80™ Colour Computer 2



6-7311



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TRS-80 Colour Computers Are Better Than Ever! We improved our most popular family of computers with a compact white case, low-profile, electric typewriter-quality keyboard and prices that are less than last year's models!

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Want to Learn to Program? Our entertaining instruction manuals will have you writing programs with colour displays and sound in no time. Colour BASIC's simple commands let you quickly produce drawings, diagrams and charts. Choose from eight brilliant colours, create musical tones, solve problems, analyse data and much more. Then save your work on tape with an optional cassette recorder.

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16K Standard Colour Computer 2. The Standard Colour BASIC language includes data and string handling, dimensioned arrays, math functions and 9-digit numeric accuracy. Includes entertaining 308-page beginner's manual.
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Clean up your stu

Do you have almost as much paperwork at home as you do at the office?

Is your household budgeting system beginning to assume the complexity of the National Debt? And your filing system now so chaotic that you need another filing system to find anything in it?

Are you a club secretary or member of the PTA drowning beneath a deluge of subscription reminder letters and invitations for sponsored walks?

The answer is the new Commodore Plus/4, the computer specially designed for the office at home.

It has the four most commonly used (and useful) software programs actually built into the computer.

Just touch a key and they're all ready to clean up.

There's an information storage and retrieval filing system (Database), word processing for letter

FOR FURTHER INFORMATION ON THE COMMODORE PLUS/4 COMPUTER · ITS COMPLETE RANGE OF PERIPHERALS · PLUS GAMES AND EDUCATIONAL SOFTWARE · PLE

dy once and for all.

and report writing, a financial analysis program to help you control your budget (Spreadsheet), and a graphics program to translate complex figures into easy-to-understand graphs.

Once your study is spick and span, then you can take advantage of the Plus/4's other features.

These include the use of advanced BASIC (a more sophisticated, yet simpler form of BASIC), a unique Help key so you can quickly identify programming errors, a large 64K memory (with an astonishing 60K available for use), and a real typewriter keyboard.

And all of that is yours for just £299.99. A small price to pay for cleaning up your study.

The Plus /4

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And cwikey! i

First we jolly well put everything you need to start home computing into one box.

Then we placed an obligingly low price on it all: under £140 for a computer, cassette unit, a super programming course and 4 great games programs.

Boys and girls (of all ages) will just love the Commodore 16 Starter Pack!

The computer has a 16K memory, real typewriter keyboard, 121 colours and also superb sound and graphics.

It uses BASIC (this is the language in which you and the computer "talk" to each other, right-ho?)

The BASIC used by the Commodore 16 is very advanced, yet really simple to use. This is because it gives you more programming commands.

But just in case any of you fellows do have any

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t's only £139.99.

difficulties, we also provide you with a Help key.

This helps to sort out programming errors by showing you exactly where you went wrong.

So you can get more out of your Commodore 16, the Starter Pack also includes "Introduction to BASIC," a guide to programming that any silly chump can follow.

And so you can get more enjoyment, there are four jolly good and splendidly challenging games: X-Zap, Punchy, Picture Builder and Chess.

If you are thinking of starting home computing, there has never been a better time than now, with the Commodore 16 Starter Pack.

No matter what age you are, old thing.

commodore

MAKRO MENZIES RUMBELOWS SAVACENTRE SPECTRUM SUPREME TESCO WALLACE HEATON W.H.SMITH WOOLWORTH AND NATIONAL NETWORK OF COMMODORE DEALERS

Before you compare our new computer system with any other, double the price.

£249
Computer complete with green screen VDU (GT64)

£359
Computer complete with colour monitor (CTM640)

CPC 464 complete with monitor and datacorder

Other computer systems that get ıywhere near the new CPC464 on spe-fication cost around twice as much.

Which other home computer, for in-tance, gives you 64K of RAM (42K vailable), 32K of ROM and a colour ıonitor or VDU?

Which other home computer, gives ou a built-in cassette data recorder, ypewriter style keyboard, numeric eypad and a very fast extended ASIC?

And which other home computer ffers it all for £359 with colour monitor - £249 with green screen VDU?

What's more, the CPC464 comes ımplete and ready-to-go. Just plug it in.

64K RAM.

Pound for pound, other micros can't ıatch the CPC464's memory. Over 2K is available to users, thanks to the ıplementation of ROM overlay tech-ques.

So there's plenty of room for soph-ticated and complex programs.

High resolution graphics. Stereo sound.

The monitor drives each colour on the creen directly from the computer. here's no unnecessary circuitry to istort your view. No tuning problems. nd no arguments about who's using ıe computer and who's watching TV.

Sounds good, doesn't it?

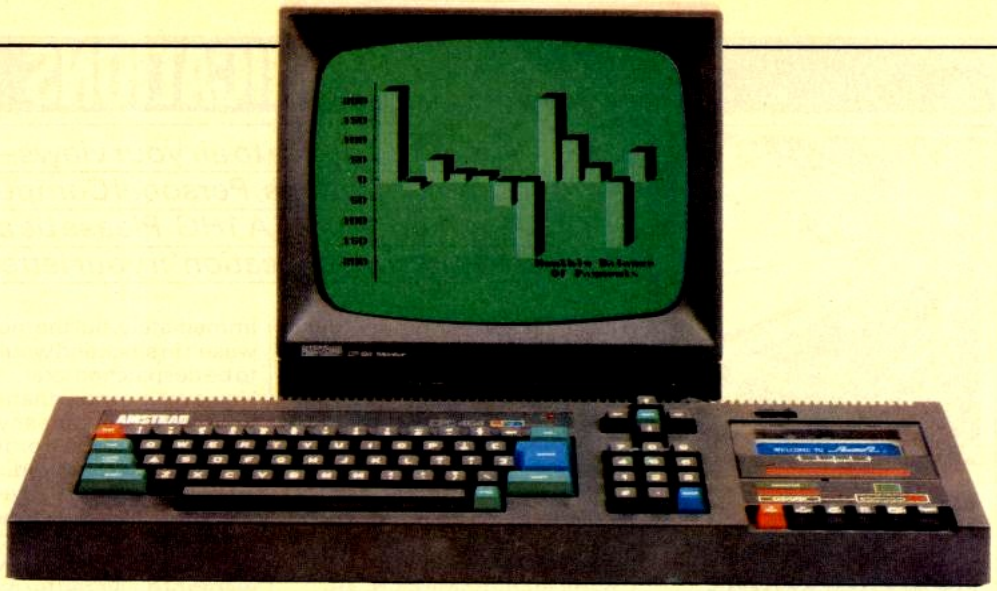
So does the CPC464 with its 3-voice, octave stereo output fed through hi-fi amplifier and speakers.

Amsoft. High quality software.

A rapidly expanding range of pro-rams is already available. High quality ftware that takes full advantage of the PC464's high specification and speed-ading capability.

Which means even complex pro-rams can be loaded quickly.

Arcade games, educational pro-rams and business applications are l designed to utilise the CPC464's ıpressive graphics, sound and pro-ssing abilities.



CPC464 green screen VDU (GT64)

Green screen VDU.

Text and numerical data are bright, sharp and easily read at a glance. Which is invaluable for word processing, accounting, budgeting and developing programs. And this purpose designed visual display system has an 80 column text display.

Green screen versions of the CPC464 can be used with a colour TV by connecting the optional power supply and modulator MP-1.

Amstrad. User Club.

The CPC464 User Club is run by Amsoft, our software division, which provides software, peripherals and publications for members.

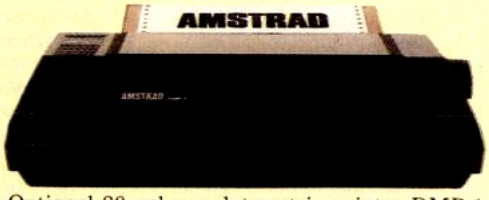
As a member, you'll enjoy immediate benefits like the privilege card, Club binder, regular magazine, competitions for valuable prizes and contact with other Amstrad users.

Whether you're interested in commercial applications or you're a games fanatic, you'll want to join the Club.

CPC464. Unlimited scope for expansion.

At Amstrad, we try to anticipate your future requirements. That's why there's a built-in parallel printer interface. A low cost optional disk drive system including CP/M* and LOGO. A joystick port. And the virtually unlimited potential of the Z80 data bus with sideways ROM support.

Optional disk drive DDI-1 including interface CP/M* and LOGO £199.95



Optional 80 column dot matrix printer DMP-1. Offers high performance computerised text processing for only £199.95.

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I'd like to know more about the quite exceptional CPC464 complete computer system. Please send literature right away.

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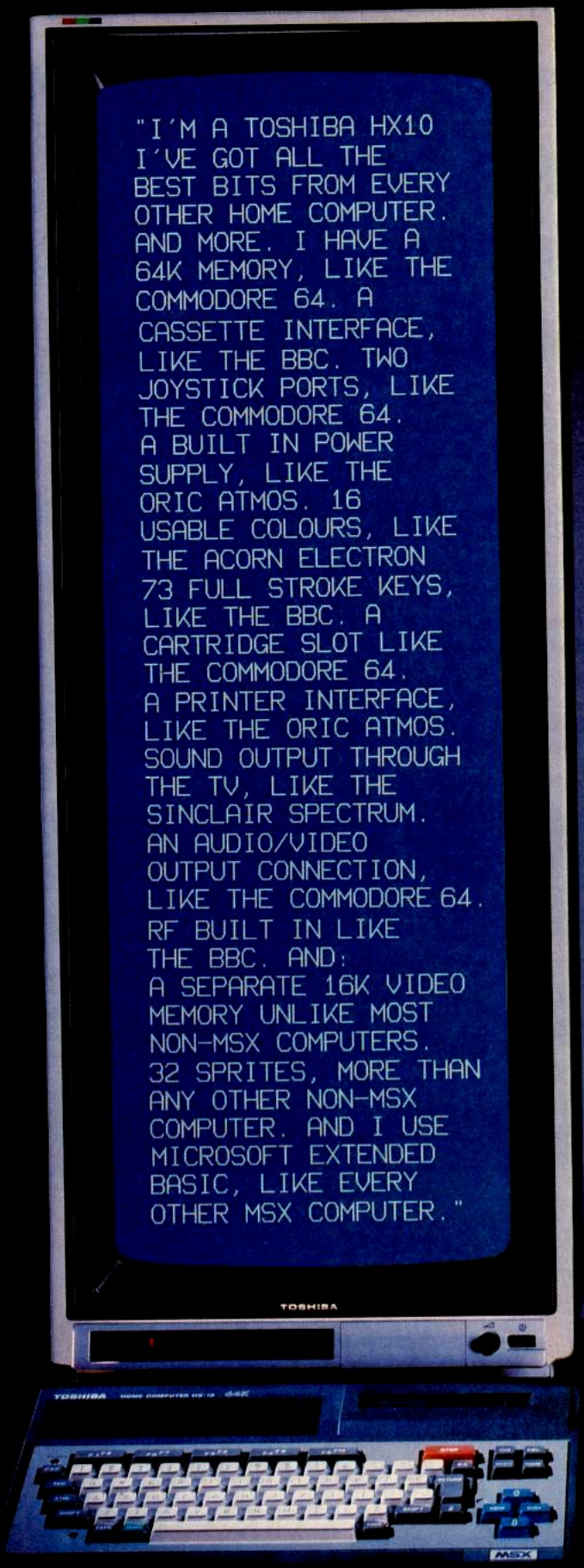
PCW3



You'd expect one of the best-selling home computers in Japan to have a specification list as big as its memory.

But the Toshiba HX10 doesn't just limit itself to that.

It was developed along with other Japanese home computers to operate on one language: MSX. You can swap programs, games, cassettes, even peripherals like disk drives, printers, and joysticks: they're all compatible with every other MSX computer.

All of which makes MSX the system of the future.

So if you want a computer that won't be obsolete in a few years, buy an MSX. If you want one of the best-selling MSX computers in Japan, buy a Toshiba HX10.

TOSHIBA MSX

FOR MORE INFORMATION ON THE TOSHIBA HX10 CONTACT TOSHIBA (UK) LTD., TOSHIBA HOUSE, FRIMLEY ROAD, FRIMLEY, SURREY GU16 5JJ. TEL: (0276) 681691.

The price tag. It's something rather special.

When you take a look at the new Goldstar MSX you'll find an asking price of around £240

Quite a bit less than most of the others. And since you're choosing a micro that's designed and built to one standard, that'll leave you a whole lot more for the super new MSX games or business software.

What is standard, of course, is the superb MSX specification.

There's one thing about this MSX that isn't quite standard.

State-of-the-art feature like 64K of 'user' RAM and 32K of ROM and 16K Video RAM place the Goldstar right at the top of the MSX league.

Sixteen vivid colours and eight octaves of sound make it a great games player's micro.

And there's a powerful Z-80A processor to take on a world of home office tasks.

Goldstar MSX. The brightest new star among micros that's unbeatable value for money

You'll find it at above standard computer dealers now.

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- ROM cartridge port
- Uncommitted parallel input/output port
- Internal ROM board port
- Hi-Fi output port
- 4-channel sound through TV speaker
- PAL composite video colour Monitor port

THE RS232 COMMUNICATIONS BOARD

(required for disc expansions)

- Two independent RS232 ports
- 60-way Disc Drive Bus supporting up to four 5.25 and/or 8 inch floppy disc drives, plus instant access Memotech Silicon Discs, and Hard Discs with capacities up to 32 Megabytes

USER RAM

- Optionally expandable to 512K in increments of 64, 128, or 256K

24K OF ROM which includes:

- MTX BASIC
- Noddy, a simple, text-handling language
- A powerful Assembler/Dissassembler – sections of machine code can be created and run by calling the Assembler from within BASIC
- The sophisticated Front Panel, which displays the contents of all registers (including the F flag register) and pointers during program execution
- All four languages can be used interactively with each other, and with the user

ROM EXPANSIONS

- MTX NewWord, a 32K word processing package
- Hisoft PASCAL, written specially for the MTX Series

THE KEYBOARD

- Full size, 79-key, full-stroke professional quality keyboard incorporating:
- Main Block with typewriter-style layout
- A separate 12-key numeric/editor keypad
- Eight programmable function keys (16 with shift)

HI-RES GRAPHICS MODE

- 256 × 192 pixel resolution plus
- 32 × 24 Text in 16 foreground and background colours
- All 16 colours (i.e. 15 colours plus transparent) are available on the screen together
- 32 user-definable easily controllable sprites
- 128 separate GENPAT statements providing a huge range of user-defined characters

TEXT MODE

- Text resolution is 40 × 24 characters plus
- 128 user-defined characters
- Eight user-definable virtual screens or "windows" (available in all modes)

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Here's An Up-Front Saving On The Tandy® 16K Colour Computer 2...

Save £20

16K Colour Computer

£99.95 Inc. VAT

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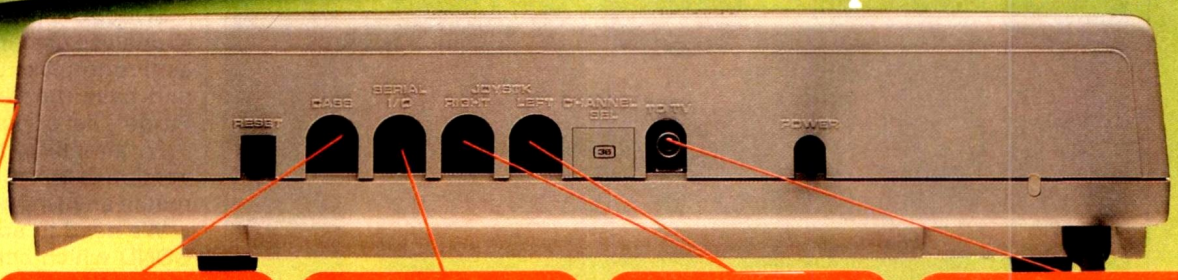
26-3134

...And Look At The Options Behind It!



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Total Support From Tandy — Simply plug in an instant loading Program Pak™ for ready to run software.

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Total Support From Tandy — Allows hard-copy and graphics using a Tandy Printer From **£79.95**

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Colour Computer Software

16K Software

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See These And More Colour Computer Software Programs At Your Local Tandy Store

Starting Off Couldn't Be Simpler!

The easy way to start computing without the barriers to progress. Whatev your requirements the Colour Computer 2 is ready to accept it. A peripherals directly and easily without costly extra interface connections a open up a computer world of programming, learning, graphics and mo Whether you want to battle against the household accounts or an arca monster Tandy has the Colour Computer for you!
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16K Extended BASIC Colour Computer 2 Version.

Save £20 £119.95 Extended BASIC Versio Normal Price £139.

16K Extended BASIC Colour Computer. Includes advanced programmi capabilities for spectacular graphics. Extra commands and features are fu explained in the inclusive tutorial manual. **26-3136** ..... **£119.**

...And Also Available As A 64K Version

Save £30 £169.95 64K Colour Computer 2 Normal Price £199.

64K Extended BASIC Colour Computer 2. All the benefits of Extended BAS plus a 64K memory mean the ability to create sophisticated programs a graphics. **26-3127** ..... **£169.**

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1985

Now Amstrad gives you over £100 to play with.

£239
complete with green screen VDU (GT64)

£349
complete with colour monitor (CTM640)

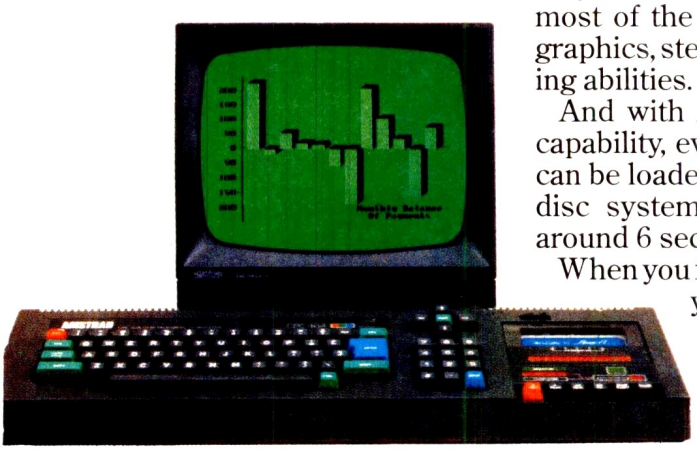
CPC 464 complete with monitor and datacorder

Free software worth over £100 is the name of the game.

Along with your new CPC 464 (colour monitor or green screen VDU) you'll receive a software starter pack of 12 (yes, twelve) cassettes absolutely free.

There's something for everyone. From Roland-on-the-Ropes to Easi-Amsword word processing.

That's *one* good reason for making Amstrad's CPC 464 your new home computer.



CPC 464 green screen VDU (GT64)

Here are the others.

The CPC 464 comes complete with its own colour monitor or green screen VDU and built-in cassette data recorder. (Optional disc drives are now available with CP/M* and DR. LOGO* supplied as standard.)

It has a typewriter-style keyboard and numeric keypad. 64K of RAM, 32K of ROM and a very fast extended BASIC with real time features.

And it costs a great deal less than the price of a comparable system.

The CPC 464 can handle the trickiest computer games (if you can), revision for exams, cataloguing and budgeting.

And it comes complete and ready-to-go.

Amsoft. A ton of software.

Yes. Now there are over 100 titles from Amsoft and independent publishers. And the list is still growing.

Arcade games, educational programs and business applications – they're all designed to make the most of the CPC 464's impressive graphics, stereo sound and processing abilities.

And with Amstrad's *speedloading* capability, even complex programs can be loaded quickly. The optional disc system will load a game in around 6 seconds.

When you feel the need to upgrade your Amstrad system to disc drive, just send your favourite Amsoft cassettes to us and we'll send you back the same Amsoft programs on Amsoft disc for just £4.95 per cassette, the price of a blank disc.

Join in the fun.

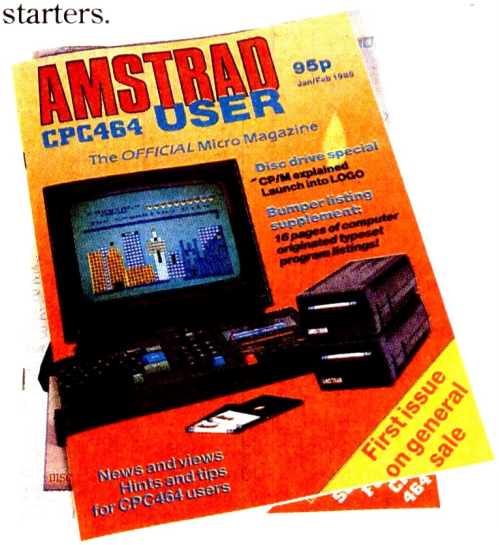
Our CPC 464 User Club is a must for all owners.

As a member, you'll be the first to know about the additions to the range. Hardware and software.

We'll provide you with your own privilege card and send you free, a year's subscription to the Amstrad User magazine packed with programs, features and information.

You can enter competitions for valuable prizes and keep up with all the latest Amstrad developments.

And with the free software pack, we think that's pretty good for starters.



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CPC 464

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I'd like to know more about the exciting CPC 464 complete computer system. Please send me literature right away.

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PRICES CORRECT AT TIME OF GOING TO PRESS. NOT ALL STORES STOCK ALL PRODUCTS.

PCW 6

Instead of computers cat
technology now has to ca

The way we see it, technology has suddenly got quite a race on its hands.

There's no other home computer in the world that's so expandable or so updatable as the new Enterprise 64.

And if you're wondering quite how we've managed that, kindly take a closer look at the outputs on our remarkable new machine.

You'll notice that amongst all the usual sockets and terminals, we've gone and incorporated a special 66-way expansion port.

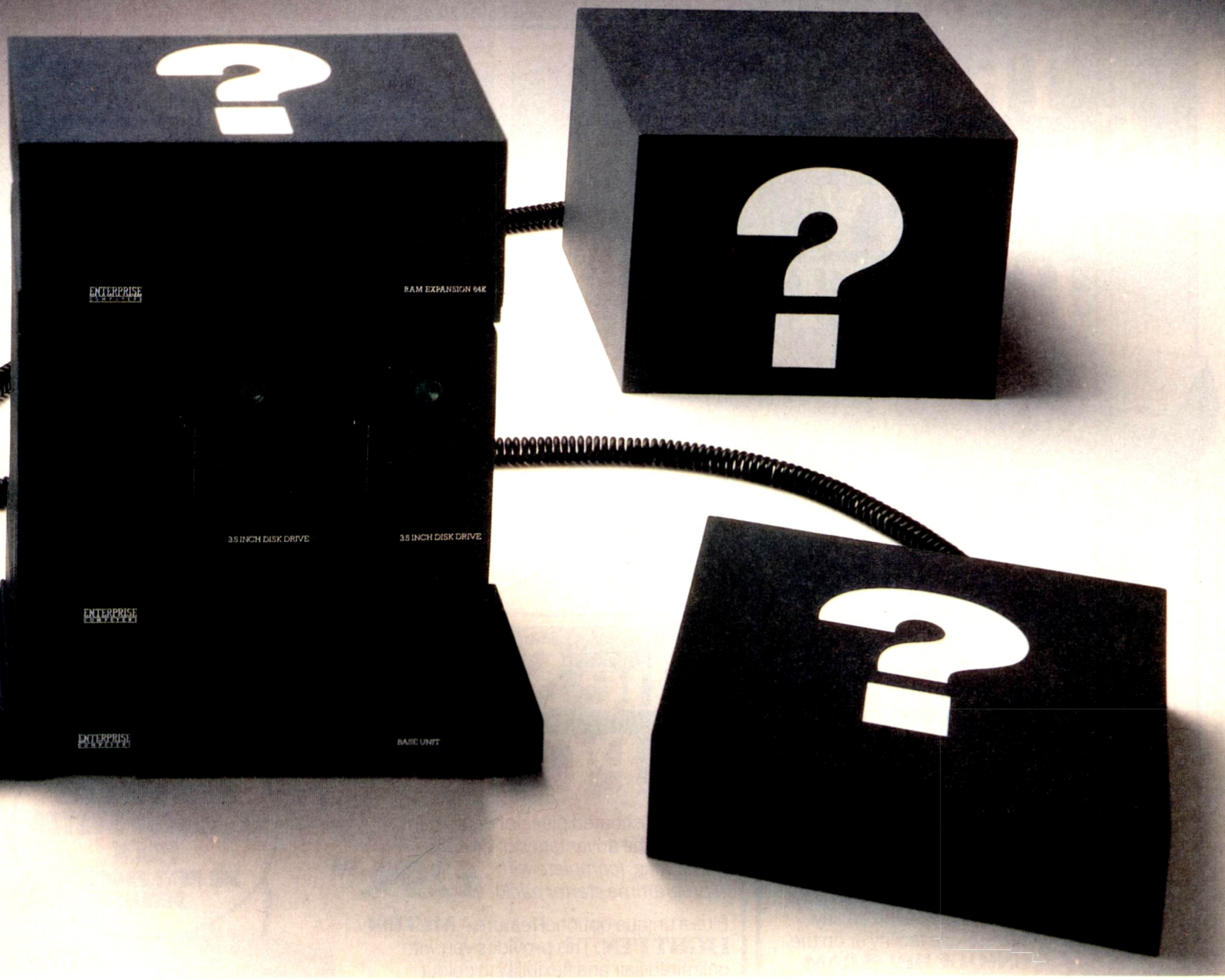
This will accept a whole range of new peripherals that are in the pipeline. Including those that are a mere twinkle in the eyes of our hardware designers.

We thought this expandability principle was such a good idea, we applied it to the Enterprise's memory, too.

Even in its most basic 64K form, this puts more user RAM at your disposal than almost any other competitor.

But plug in our special Rampacks to the base unit, and you can progressively increase that figure to a truly extraordinary 3,900K.

ning up with technology, tch up with a computer.



Not that that's the only challenge we present to today's ambitious programmers.

With a screen resolution of up to 672 x 512 pixels, 256 colours and a high speed video processor, the Enterprise will outgun all but the highest quality TV monitors.

And the sophisticated sound chip generates no fewer than 4 voices across 8 octaves in full stereo.

Combine the two and you can create effects that leave today's games looking like pub video tennis of the mid-seventies.

For anyone with literary aspirations, the Enterprise also comes complete with an integrated word processor.

Whilst the really serious user will be delighted to discover analogue RGB and TV outputs, as well as parallel, RS423 serial and network ports.

Both Cobol and 'C' will be available with CP/M running, and you can even use Lisp, Forth and Z80 assembly language on cartridge without encroaching on user RAM.

The new Enterprise 64.

It hasn't just overtaken technology. It's left every other home computer straggling in the distance.

ENTERPRISE
COMPUTERS

WITH OBSOLESCENCE BUILT-OUT

NOT ALL MSX SYSTEMS ARE BUILT ON YEARS OF EXPERIENCE.

While there are plenty of MSX home computers about, only Sanyo's MPC 100 can claim a heritage of years of experience and expertise.

The kind of experience other systems can't simply be programmed with.

The kind of expertise that has made Sanyo one of the world's leading manufacturers of business micros.

With a reputation for quality and, unlike t MSX competitors, a factory entirely devoted t computer production.

The MPC 100 also boasts features impres

ONE IS.

gh to match its pedigree. 64K memory,
rb 16 colour graphics, and 3 channel/8 octave
d. Operable by joystick or light pen options,
machine includes a bonus of two free pieces
ftware.

Most MSX manufacturers have yet to prove themselves in computers. Sanyo have been doing so for years. Which is worth remembering, or instead of solid rock, you could end up building your MSX business on sand.

SANYO

SEE SANYO, THEN DECIDE

FOR FURTHER DETAILS CONTACT SANYO MARUBENI (UK) LTD., SANYO HOUSE, OTTERSPOOL WAY, WATFORD, HERTS.
TEL: WATFORD 46363. ASSOCIATE MEMBER OF RADIO, ELECTRICAL AND TELEVISION RETAILERS' ASSOCIATION (RETRA) LTD.

On one hand, the best all-round performance

Colour Genie is now one of the most successful home computers that you can buy.

Not just because of price.

But simply because more families are realising that a computer with less all-round performance than the 32K Colour Genie is a waste of money and not so rewarding.

After all, you cannot tell what will interest you most until you've tried everything computers can offer you.

Some others ask you to compare the technical facts. Well, to give them all a surprise we've published some of 32K Colour Genie's most important features.

But for the less technical, here are a few other important questions and answers.

WHY YOU CAN'T BUY A COLOUR GENIE AT THE CORNER SHOP

You see, ALL computers are more complex than they first appear.

So when you start computing, you do need a bit of help. A Saturday shop assistant is NOT the right person to go to.

To ensure that you obtain the answers to any doubts or questions you may have about computers, a list of the many Genie specialists appears below. But if you have any problem whatsoever, get in touch with us at Lowe Computers — we're here to help.

WHY OUR 32K CAN MEAN A LOT MORE THAN EVEN THE MOST RECENT COMPETITORS

It's easy to quote big memory numbers like 32K. In many other popular computers of that size, it is not so easy to use it all.

Even some of the newest models let you use little more than two thirds of the user memory. The other third is snatched away to drive the computer.

- Design efficiency. 95% of RAM is available for user memory
- 16K ROM with Microsoft Colour BASIC Extended
- Forth (optional)
- 256 predefined characters with 128 more you can program yourself. A massive 256 can be displayed at any one time
- Repeat operates on all 63 keys
- 4 function keys giving 8 user programmable statements
- Full editing and tracing facilities for de-bugging
- Screen resolution of 320 x 200 with text and graphics
- Or 160 x 102 individually addressable pixels in 4 colours
- Screen display, 25 rows of 40 characters
- 16 colours (8 full, plus 8 tints)
- 80 commands plus more than 40 graphics, arithmetic and special functions
- 8 octaves, independent on each of 3 separate sound channels with independent volume, duration and envelope on each channel
- Full synthesised sound effects via separate T.V. or Hi-Fi output ports
- Cartridge based software
- Prestel/Viewdata modem. Software cartridge loaded for fast system access
- Floppy disc system
- Superb digital joysticks, with numeric pads and two fire buttons.

Colour Genie has the type of "drive" facility that you would expect to find on a computer costing around £400. It uses less than 5% of RAM -giving you as much as 30K for more exciting games and more useful applications.

WHY GOOD PICTURES CAN BE MORE COLOURFUL ON THE COLOUR GENIE

Many other computers offer several modes. These give high resolutions but at a cost.

On some, high resolution uses so much RAM that you get only 2 colours, and very little memory left to play with.

But Colour Genie has got other ideas to let you have the good quality picture effect of high resolution (320 x 200 for the technical). AND FULL COLOUR

THIS IS HOW IT WORKS.

Colour Genie lets you create as many as 128 different shapes that it tucks away in its memory, in addition to the 128 shapes it has permanently stored (you can see 64 of them on the keys in the photograph).

AVON BATH Microstyle (0225) 319705 **BERKSHIRE** NEWBURY Microstyle (0635) 42570 SUNNINGDALE Kenneth Ward & Co (Computers) (0990) 25025 WINDSOR Windsor Castle Computers (075 35) 58118 **BUCKINGHAMSHIRE** NEWPORT PAGNELL Photo Acoustics Ltd (0908) 610625 AMERSHAM Amersham Computer Centre Ltd (024 03) 22307 **CAMBRIDGESHIRE** PETERBOROUGH Hands on Computers (0733) 312418 **CHESHIRE** MACCLESFIELD Hewart Electronics (0625) 22030 NORTHWICH Finchmead (0606) 48462 CREWE Midshires Computer Centre (0270) 211086 **CLEVELAND** CLEVELAND Cleveland Small Business Corp. (0642) 602003 MIDDLESBROUGH Briers Computer Services (0642) 242017 **CORNWALL** FALMOUTH Fal-Soft Computers (0326) 314863 ST AUSTELL A.B. & C. Computers (0726) 64463 **CUMBRIA** KENDAL Radex-Visionscan (0539) 22559 **DERBYSHIRE** MATLOCK Lowe Computers (Head Office) (0629) 4057/4995 **DEVON** ILFRACOMBE Bits & Bytes (0271) 62801 NEWTON ABBOT Ablac Business Systems (0626) 62296/7 Home Electronics (0626) 63784 PLYMOUTH West Devon Electronics (0822) 853434 **DORSET** BOURNEMOUTH Cuthele Ltd (0202) 525423 BLANDFORD Blandford Computers (0258) 53737 POOLE Parkstone Electronics (0202) 746555 **DURHAM** DURHAM Comtec Systems Ltd (0385) 40008 PETERLEE General Northern Microcomputer (0783) 860314 **ESSEX** CHELMSFORD Infolab Ltd (0245) 357111 COLCHESTER Emprise Electronics Ltd (0206) 865926 **GLOUCESTERSHIRE** CHELTENHAM Computer Shack (0242) 584343 GLOUCESTER Elfin Systems (0452) 411533 Milequip Ltd (0452) 411010 **HAMPSHIRE** ALDERSHOT Connaught Computing (0252) 22618 FAREHAM Fareham Computer Centre (0329) 239191 **HERTFORDSHIRE** BERKHAMSTEAD Chrisalid Systems & Software (044 27) 74569 OLD HATFIELD Combined Trading Co. (07072) 65551 STEVENAGE Q-Tek Systems Ltd (0438) 65385 **HUMBERSIDE** HULL Computer Centre (0482) 26297, Tomorrow's World (0482) 24887 **KENT** CHATHAM Medway Computers (0227) 826080 GILLINGHAM Business Systems (0634) 382652 SWANLEY Swanley Electronics (0322) 64851 **LANCASHIRE** BLACKPOOL Holden Microsystems (0253) 27590 Leisuronics Computer Stores (0253) 27091 Unicorn Business Machines (0253) 294625 BURNLEY Sound Service (0282) 38481 DARWEN Personal Computer Services (0254) 776677 WITHINGTON Parnio and Co. (061) 445 8918 **LEICESTERSHIRE** LEICESTER Arcade Computers (0533) 532991, Eley Electronics (0533) 861522, Leicester Micro Centre (0533) 551869 LUTTERWORTH Lutterworth Software (045 55) 4259 **GREATER LONDON** ANERLEY Premier Micro Systems Ltd 01-659 7131 DARTMOUTH PARK Chromasonic Electronics 01-263 9493/5 EDMONTON Wason Microchip Ltd 01-807 1757 KINGS CROSS Lowe Computers 01-837 6402 MARYLEBONE Computer of Wigmore St 01-486 0373 NEW MALDEN Cinegraphic Ltd 01-647 5836 NORTHWOOD Screens (092) 742/0664 OXTON PARK Electrical Trading Co. 01-552 4112 **GREATER MANCHESTER** LEVENSHULME A.B.C. Supplies (061) 431 9265 **WEST MIDLANDS** COVENTRY J.B.C. Micro Services (0203) 73813 CRADLEY HEATH A.E. Chapman & Co. Ltd (0384) 66497 ERDINGTON Consultant Electronics (021) 382 7247 HANDSWORTH Ward Electronics (021) 554 0708 STOURBRIDGE Ronix Computers Ltd (03843) 77569 WALSALL Progress Computers (0922) 640553 WOLVERHAMPTON Hemington Computers (0902) 27200 **NORFOLK** NORWICH Anglia Computer Centre (0603) 29652 **NORTHAMPTONSHIRE** NORTHAMPTON Richard Reeves (0604) 33578 DAVENTRY Daventry Computer Centre (Microstyle) (032/72) 78058 WATFORD Photo Acoustics Ltd (0923) 40698 **NOTTINGHAMSHIRE** MANSFIELD Mansfield Computers and Electrical (0623) 31202 NOTTINGHAM East Midland Computer Services (0602) 267079, Midland Electronics (0602) 783938, Midland Microcomputers (0602) 298281 **OXFORDSHIRE** OXFORD Micro Business Systems (0865) 73145 THAME Pebbleglow Ltd (084 421) 5365 WITNEY Magnus Microcomputers (0993) 6703 **SHROPSHIRE** NEWPORT Tarrant Electronics (0952) 814275 CHURCH STRETTON Sales (0694) 723395 **STAFFORDSHIRE** STOKE-ON-TRENT Midland Computer Service (0782) 815476 **SUFFOLK** IPSWICH Ipswich Computer Centre (0473) 214456 **SURREY** CROYDON Croydon Micros 01-689 4349

On the other, the lowest price in its class

£168! (incl. VAT)

You can then use all 256 in any order to create a full picture "brick- by- brick", for any game or application you invent.

And you can colour each shape in any of the 16 colours and tints, each time you use it.

The pixel graphics mode allows line plotting and generation of solid shapes.

Check out our "PAINT" command, for remarkable computing.

YOU WANT WORDS AS WELL!

Sure – Colour Genie won't limit you on that! Text and graphics are fully mixable.

WHY YOU CAN PLAY AMAZING GAMES – AND AMAZING GRACE

Not only can you play -or make exciting games. You can do it very noisily too!

Colour Genie gives you three independently controlled seperate channels (or 'voices') each with a full range of 8 octaves.

So you can compose pleasant music – or drive everyone out of the house!

WHY COLOUR GENIE IS A TOUCH HEAVIER THAN MOST OTHERS

Some computers are designed as a simple box, with several untidy add-on pieces. Not only do add-ons add to cost, but they can add to more niggling faults as well.

So Colour Genie contains all that's necessary to make it work including the power transformer.

It is also made of stronger materials than many others, to cope with the most boisterous of families.

But just in case you find a 10lb box a bit awkward to carry to the car, you'll find it has got a built-in carrying handle!

Just another touch of service with the compliments of Lowe Computers. The top name in home and hobbyist communication and computer systems.

Special offer worth at least £40

FREE suite of 7 programs.
2 games, 3 utitlity programs and 2 music demonstrators.

Extensive and rapidly expanding software library holding all the best games PLUS education, mystery, adventure, business and utility programs

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COLOUR GENIE IS NOW THE CHEAPEST 32K HOME COMPUTER WITH A FULL-SIZED PROFESSIONAL TYPEWRITER KEYBOARD.*

*As at 1/9/83

☐ Please rush me a 32K Colour Genie plus special offer. I enclose £168
☐ Details of your instant credit plans ☐ Information on Colour Genie

NAME _____

ADDRESS _____

POSTCODE _____

Lowe Computers, Lowe Electronics Ltd., Chesterfield Road, Bentley Bridge, Matlock, Derbyshire DE4 5LE. Telephone (0629) 4995/4057

PCG11/83

If all MSX Computers are the same how is Sony's Hitbit different?

MSX is a worldwide computer standard, chosen by most of the world's largest electronics companies. With MSX machines, all software and all hardware is completely compatible... games, educational and business programs as well as disks, joysticks and printers, which means you can borrow your friends' MSX software and play it on your machine, and because it's an agreed standard, it will be here for years to come. Obsolete? Not with MSX.

Like other MSX manufacturers our Hitbit 75 has the best 'basic' around, great colour, great sound, a 64k memory and more ports than you'll probably ever need.

Hitbit also has a disk drive, printer, data cartridge and a remote control joystick. But, who else offers free, a unique personal data base that can store addresses, schedules or even remind you when to feed the cat?

Who else offers our superb Sony styling?

Who else enjoys such a reputation for reliability? Only the Sony Hitbit, the logical choice in computers. SONY.

Sanyo's MSX may be fun, but it's far from frivolous.

Our MPC 100 is the kind of quality machine only one of the world's leading manufacturers of business micros could produce.

You'll revel in its 64K memory, superb 16 colour graphics, and 3 channel/8 octave sound, operable by light pen or joystick options.

You can rely on Sanyo back-up as well. We've a factory entirely devoted to computer production. Other MSX manufacturers haven't.

So even if you do just want an MSX for playing games, you could end up a loser if you don't first see Sanyo, then decide. SANYO

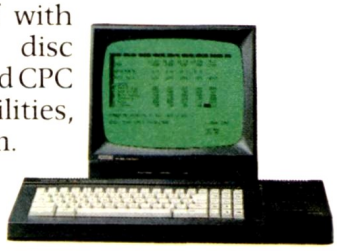
When it comes to MSX, we're not just playing games

It does accounts, projections

No wonder people are racing out to buy Amstrad's new CPC 6128 computer.

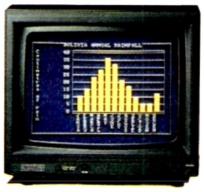
Not only does it answer all your business needs, it's also compatible with nearly 200 arcade and adventure games. So it can either speed you through your income tax returns or whizz you round a simulated Silverstone.

On the business side we start you off with a free disc which introduces you to the Amstrad CPC 6128's impressive range of capabilities, and the best ways to exploit them.



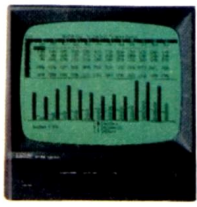
You'll discover how its massive 128k memory can open the door to over 8,000 CP/M* applications.

Programs like 'Wordprocessing' and 'Database' will file and index records, produce standard letters, mailing lists and even compile reports.



There's a series of business control programs which form a complete invoice, stock control and statement system.

In other words it's easy to choose the software you need to take the big problems out of your small business.



But even if you don't own a business there are plenty of good reasons for owning an Amstrad CPC 6128.

It makes short work of the problems we all face. Like keeping track of rates, mortgage and H.P. payments.

However even software packages as comprehensive

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wordprocessing and 180mph.

as Amstrad's are only as good as the hardware they're loaded into.

You need a complete system.

That's why the Amstrad comes complete with a built-in disc drive as well as a monitor (green screen or full colour). So it's ready to go to work as soon as you get it home.

And if you want to go further additional disc drives, printers and joysticks are all available to ensure that your computer can grow with your growing needs.

Finally there's one feature of the Amstrad CPC 6128 that's both good business and a pleasure: the price.

With Green Screen around	£299
With Colour Monitor around	£399

PCW/6128/1

Tell me more about the Amstrad CPC 6128

Name _____

Address _____

_____

_____

Amstrad CPC 6128 with 128k memory

Who says business and pleasure don't mix?

Amstrad P.O. Box 462, Brentwood, Essex CM14 4EF.

*CP/M is a trademark of Digital Research Inc.

SUPREME DISCOUNT STORES · TANDY · VALLANCES · W. H. SMITH · WIGFALLS · F. W. WOOLWORTH AND GOOD INDEPENDENT COMPUTER STORES

SPECTRUM+ PRICE BREAKTHROUGH!

Once again, Sinclair leads the way in performance and price!

The 48K Spectrum+ is our exciting new home computer.

It has all the best features of the original, best-selling Spectrum – plus a large, typewriter-style keyboard.

At the new price of £129·95, it's astonishingly good value. But then, what else do you expect from Sinclair?

Britain's leading home computer

No other computer can possibly match the variety of talents of the Spectrum+.

It gives you a massive 41.5K of usable memory (more than costlier computers such as the Commodore 64, BBC Model B or Electron). And with more memory, you're able to run bigger, better programs.

In the shops, the range of Sinclair software and peripherals for the Spectrum+ is unrivalled.

As one reviewer put it recently, the Spectrum+ 'gets more exciting and innovative software written for it than any other machine'.

Buy now – and get six software titles for the price of one!

Buy a Spectrum+ now, and you can take home the new Spectrum+ Six Pack for just £14.95, instead of the normal Sinclair price of over £66.

The Six Pack includes six of our best programs – word processing and 3D graphics, a typing tutor, Computer Scrabble and Chess, and our latest arcade game+.

You'll find the Spectrum+ at its new low price of £129·95, and the Six Pack, at Sinclair stockists nationwide.

The Spectrum+ Six Pack offer is limited to new Spectrum+ purchases.
*Previous price included a Six Pack. † Titles may vary.

Sinclair Research Ltd, Camberley (0276) 685311.

Sinclair, ZX Spectrum and Spectrum+ are Trade Marks of Sinclair Research Ltd

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AT £129, LOOK HOW THE ATARI 800XL COCKS A SNOOK AT THE COMPETITION.

AT LAST, SERIOUS HOME COMPUTERS ARE UP AGAINST SERIOUS COMPETITION. THE ATARI 800XL OFFERS EVERYTHING COMPETITORS IN OUR PRICE RANGE OFFER. AND AS YOU CAN SEE ON THE LEFT, A GREAT DEAL MORE. PLUS SOFTWARE PRICES THAT START AT LESS THAN £10.

ATARI 800XL

FOR FURTHER DETAILS CONTACT YOUR NEAREST ATARI DEALER: BOOTS, CARREFOUR, CO-OP, CURRYS, DIXONS, GRANADA, LASKYS, LEWIS'S, LITTLEWOODS, MAKRO, RUMBELOWS, SILICA SHOP, SPECTRUM, VALLANCES, WIGFALLS AND ALL OTHER COMPUTER SHOPS.

The price tag. It's something rather special.

When you take a look at the new Goldstar MSX you'll find an asking price of around £240

Quite a bit less than most of the others. And since you're choosing a micro that's designed and built to one standard, that'll leave you a whole lot more for the super new MSX games or business software.

What is standard, of course, is the superb MSX specification.

There's one thing about this MSX that isn't quite standard.

£199.99!

State-of-the-art feature like 64K of 'user' RAM and 32K of ROM and 16K Video RAM place the Goldstar right at the top of the MSX league.

Sixteen vivid colours and eight octaves of sound make it a great games player's micro.

And there's a powerful Z-80A processor to take on a world of home office tasks.

Goldstar MSX. The brightest new star among micros that's unbeatable value for money.

You'll find it at above standard computer dealers now.

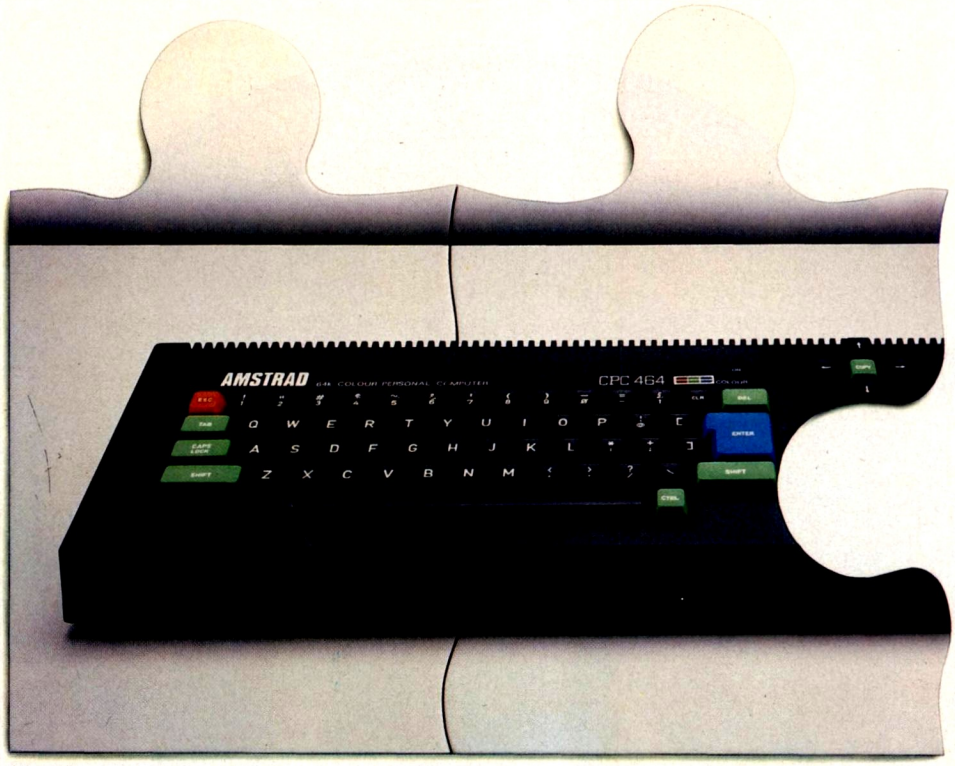
GoldStar

Distributed by:-

MICRO DEALER UK Ltd

29 Burrowfield, Welwyn Garden City Herts AL7 4SS

Tel: (07073) 28181 Telex: 23674 MDUKG



Most home computers.

As you can see, the Amstrad CPC 464 is no ordinary home computer.

For a start, it comes complete with an integral cassette datacorder.

And in addition, you get the choice of either a superb quality green screen or a full colour monitor.

With £100 of free software to get you going all you have to do is plug in and start computing.

The 64k of RAM means you'll have plenty of memory to play with. And there are over 200 Amsoft games, that you can play, many exclusive to Amstrad.

But games are only half the fun on the Amstrad CPC 464. In fact using it can also be quite an education.

The kids can learn spelling and arithmetic with software like Wordhang and Happy Numbers.

Whilst adults will love the way it helps around the house with budgetting and accounts.

Put the 464 to work and it will take care of a number of business-like functions, such as wordprocessing and spreadsheet.

AVAILABLE AT BOOTS · BRIDGERS · CLYDESDALE · COMET · CURRYS · DIXONS · GRANADA · GREENS · LASKYS · JOHN LEWIS · RUMBELOWS ·

The complete home computer.

To help you get the most from your CPC 464, there's the Amstrad User Club as well as a number of books and user magazines devoted to this most versatile home computer.

And your 464 will be made even more complete with the simple connection of joysticks, printers, disc drives, speech synthesisers and light pens.

But perhaps the most extraordinary thing about the Amstrad CPC 464 is the price.

Just £199 with green screen, or £299 with full colour monitor.

For more information about the complete home computer, all you have to do is complete the coupon.

PCW/464/1

Please send me more information

Name_____

Address_____

Amstrad CPC 464
The complete home computer.

Amstrad, P.O. Box 462, Brentwood, Essex CM14 4EF.

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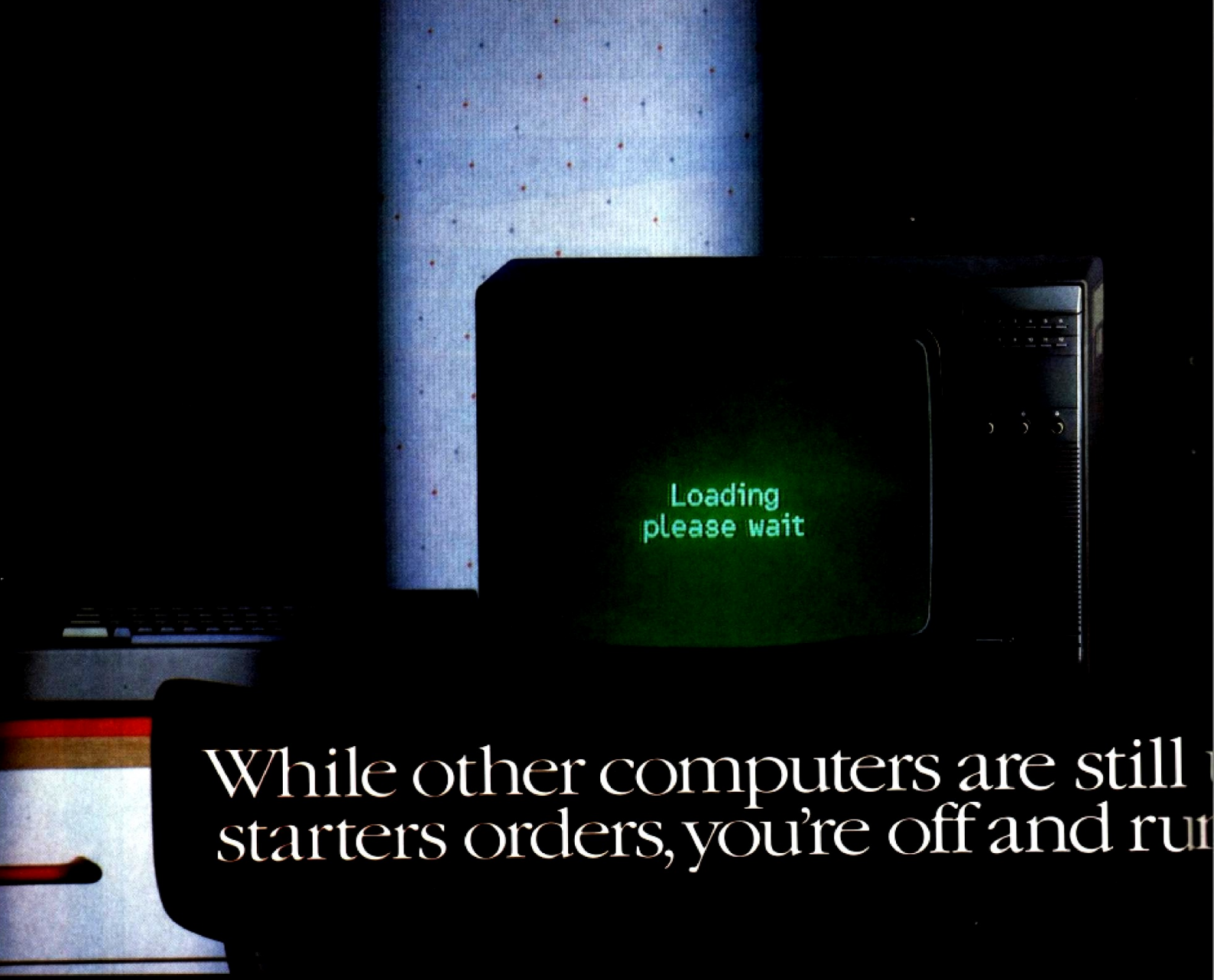
1986



While other computers are still
starters orders, you're off and ru

The Amstrad 6128 has a built-in advantage over most other home computers.

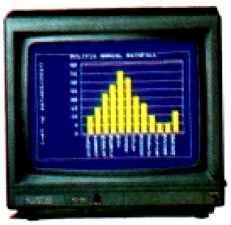
Its fast loading disc drive unit.

An ordinary cassette driven computer can take as long as 15 minutes to load.

Whereas the 6128's built-in disc drive will load the same programme in seconds.

Which means you don't waste valuable playing time loading.

And it also means you can quickly get into more sophisticated programmes, using more of the 6128's big 128K memory.



Loads more business programmes

There are hundreds of games to play on the 6128, but it also has its serious side.

It can handle spreadsheets, database and account management programmes.

It can file and index, produce standard letters and compile reports.

And it will even keep track of rates, mortgage and H.P. payments for you if you want it to.

The 6128 comes complete with green screen or full colour monitor, as well as keyboard with

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BELOW

built-in disc drive.

But if you want still more, additional disc drives, printers and joysticks are all available.

You could be off and running on a 6128 for as little as £299 (green screen) or £399 (colour monitor).

At those prices, you won't be surprised to learn that it sells almost as fast as it loads.

WITH GREEN SCREEN AROUND	£299
WITH COLOUR MONITOR AROUND	£399

- ULTIMATE - W.H. SMITH - WIGFALLS - AND GOOD INDEPENDENT COMPUTER STORES

Please send me more information fast.

Name _____

Address _____

_____

6128/ACU 12/86

The Amstrad 6128.

With disc drive and 128K memory.

Amstrad P.O. Box 462, Brentwood, Essex CM14 4EF.

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TRUE VIDEO
INV VIDEO
GRAPH
BREAK
CODE
CAPS LOCK
ENTER
SYMB SHIFT
CAPS SHIFT
MONSTER MEM

GET YOUR HANDS ON THE NEW SINCLAIR 128K +2. BEFORE EVERYBODY ELSE DOES.

The new 128K ZX Spectrum +2 is more than just a monster memory.
It's the ultimate family computer.
With a built-in datacorder for easier loading, superb graphics capability, two joystick ports, a proper typewriter keyboard and more games available than you can shake a joystick at (well over 1000 software titles, in fact).
Better get your hands on the new 128K ZX Spectrum +2 soon.
Before they do.

£149

ORY · MONSTER VALUE

Available from: Allders, Boots, Clydesdale, Comet, Connect, Co-op, Currys, Dixons, Electric Supreme, Laskys, John Lewis, John Menzies, Power City, Rumbelows, Ultimate, WH Smith, Wigfalls, and good independent stores.

We recommend Sinclair Quality Control Software.

To: Sinclair, P.O. Box 462, Brentwood, Essex C14 4ES.
Please send me more information about the Sinclair 128K ZX Spectrum +2.

Name _____

Address _____

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THE NEW SINCLAIR HAS ONE BIG DISK-

THE SINCLAIR ZX SPECTRUM+3 WITH 6 FREE GAMES AND A JOYSTICK.

ADVANTAGE.

ZX SPECTRUM +3. £199

The new Sinclair ZX Spectrum +3 is a real hero – because it helps you to be one.

While you're a daring motorbike rider or the all-conquering intergalactic warrior, you're gaining priceless experience in handling computers.

Loading games is quick and easy with the built-in disk-drive. You'll be in the thick of the action in seconds. And the fantastic 128K memory gives you the power to outsmart the most sophisticated enemy.

Get to grips with the latest high-tec graphics on the vast universe of games available (six of which come free). And there's a free joystick to give you ultimate control.

But the real hero is the person who buys it. For the ZX Spectrum +3 is only £199, so they've really saved the earth.

ZX SPECTRUM +2. £139

The amazing ZX Spectrum +2 has a built-in datacorder – to save you the bother of tape recorders and leads. The advanced 128K memory helps you get the most from the vast universe of games available.

Every model comes complete with six free games to start you off, and a free joystick to make you super agile.

With the advanced Sinclair technology you can afford to let your imagination go wild. Because at £139, only your enemies pay heavily.

BE WHO YOU WANT TO BE.

Available at: Allders, Boots, Clydesdale, Comet, Connect, Currys, Dixons, John Lewis, John Menzies, Lasky's, Tandy,* W.H. Smith, Visionhire, Wigfalls, and all good independent stores.

*ZX Spectrum +2 only.

Recommended retail price Sinclair ZX Spectrum +2 £139 including VAT, Sinclair Spectrum +3 £199 including VAT at 1.10.87. Prices subject to change without prior notice.

Please tell me more about the SINCLAIR ZX Spectrum +2 ☐ ZX Spectrum +3 ☐

Name_____

Address_____

SG 1

Amstrad plc, Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF. Tel: (0277) 262326

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1988

BE WHO YOU WANT TO BE.

WITH A SINCLAIR ZX SPECTRUM YOU CAN AFFORD TO LET YOUR IMAGINATION RUN WILD.

While you're a daring motorbike rider or the all-conquering intergalactic warrior, you're gaining priceless experience in handling computers.

ZX SPECTRUM +3. £199

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Get to grips with the latest high-tech graphics on the multitude of games available (six of which come free). There's also a free joystick to give you ultimate control. And at only £199, you're bound to save the earth.

ZX SPECTRUM +2. £139

The amazing ZX Spectrum +2 has a built-in datacorder – to save you the bother of tape recorders and leads. The advanced 128K memory helps you get the most from the hundreds of games available.

Every model comes complete with six free games to start you off, and a free joystick to really get you into the action.

With the advanced Sinclair technology you can afford to let your imagination go wild. Because at £139, only your enemies pay heavily.

Available at participating branches of: Allders, Clydesdale, Comet, CO-OP/CRS, Currys, Dixons, Gateway Superstores, Hughes TV & Video, JLP, Laskys, Peter B Ledbury, John Menzies, R.V.S. Ltd, Tandy, and all good stockists.

R.R.P. Prices (inc. VAT) correct at 1.9.88. Prices subject to change without prior notice. Products subject to availability. All software subject to licence. Sinclair is the registered Trademark and ZX Spectrum +2/+3 the Trademarks of Amstrad plc. © 1988 Amstrad plc. All rights reserved.

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Please tell me more about the SINCLAIR ZX Spectrum Range

Name _____

Address _____

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I already own a Sinclair YES/NO _____

Amstrad plc, P.O. Box 462, Brentwood, Essex CM14 4EF. Tel: (0277) 26232

The price of coming at the Olympics

first

If you weren't selected for the Seoul Olympics, no need to feel out of the running.

Because everything you need to compete in all the events is right here with the Commodore 64 Olympic Challenge pack. And at only £149.99, your gold medal's practically in the bag.

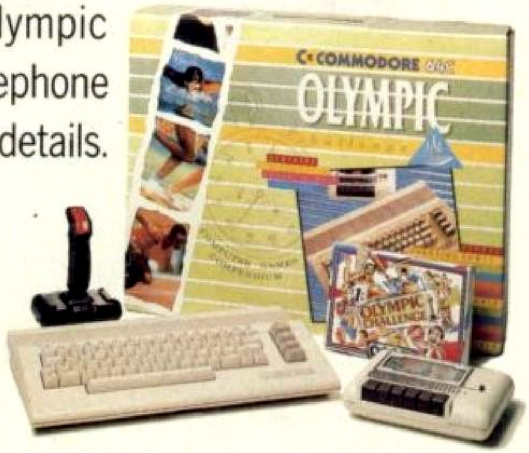
Here's the C64 Olympic line-up...

* **C64 Computer, the latest version of the world's best-selling computer.**
* **Cassette unit, for simple loading of programs.**
* **Joystick to put you in complete control of screen action.**
* **Plus all the excitement of 10 great sporting games.**

On day one, you can use all your skills and reflexes to race against the clock in the track and field events. Or take up the challenge of world series baseball, weightlifting, football, tennis and the championship title fights.

And when the Olympics are over, you can then go out and grab the best beat 'em ups, one-on-one, adventure and simulation games that really come alive on the C64.

There's only a few days to go before the opening ceremony, so make a dash for your local dealer and ask about the C64 Olympic Challenge pack. Or telephone 0800 800 477 for more details.



Commodore

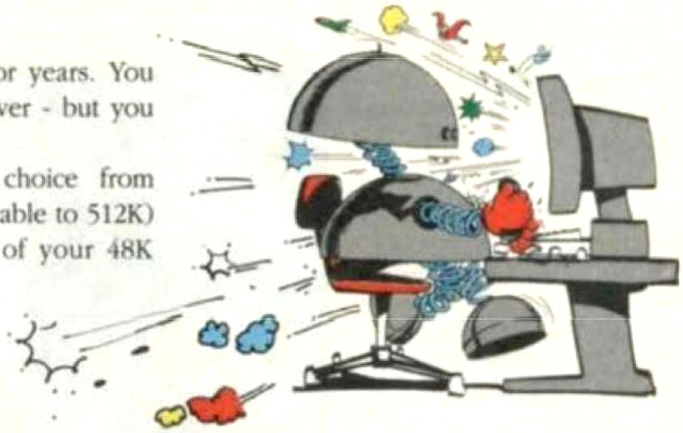
1989

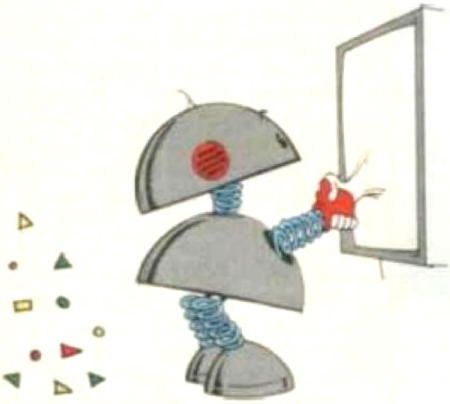
MILES GORDON TECHNOLOGY plc

SAM coupé

SO WHY DO SPECCY OWNERS NEED THE SAM coupé ?

You've been building up your Spectrum software collection for years. You want a computer with better sound, better graphics, more power - but you don't want to lose your software.
The Coupé is the computer for you. Four screen modes with a choice from 128 colours, a six-channel stereo sound chip, 256K RAM (expandable to 512K) - yet by actually slowing the Coupé down, we allow most of your 48K Spectrum software to run in the Coupé's level 1 mode.





Growth

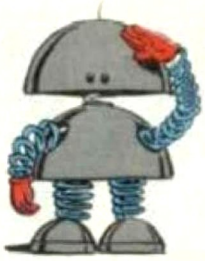
You never stand still with a computer. You're always learning, always growing, always wanting to do more. With the Coupé, your computer can grow with you.
Memory can be expanded from 256K to 512K. One or two 1 MB disk drives can be added. There are output ports for almost everything we can think of, and an expansion connector for things that other people develop later. And all of it simply slots in - no screws, no soldering, no hardware expertise.

Graphics

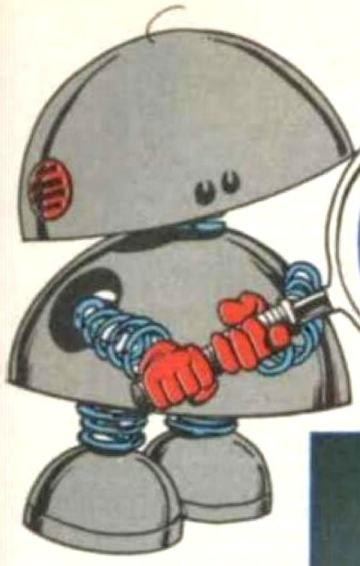
See the full range of 128 colours on an ordinary TV set. Or better still, use a video monitor for really high definition. Best of all, use a modern TV with SCART to get the quality of a monitor on an ordinary TV set.
The Coupé has four graphics modes. Even at the lowest level - Spectrum emulation - you can change the colours in the the software to take full advantage of the palette. In modes 3 and 4, you can display up to 16 colours per line, a different colour for every pixel in a 256 x 192 pixel display; or have an 80-column 512 x 192 display for word processing and spreadsheets.
And free with the Coupé comes FLASH!, a software package by ace Swedish programmer, Bo Jangeborg, designed to give you total control over these powerful graphics.

Music

There won't be a better buy for all you aspiring electronic musicians. The Coupé features a full implementation of MIDI - MIDI In, Out and Through - with 16 channel capability, and MGT is promoting a full range of MIDI support software. Better still, the Coupé features an 8 octave, 6 channel stereo sound chip. For sensational sound effects, just plug in your headphones.
Play it again SAM!



SAM. No, the computer's not called SAM, it's called the Coupé. This is SAM - he's the character who will guide you through the manual.

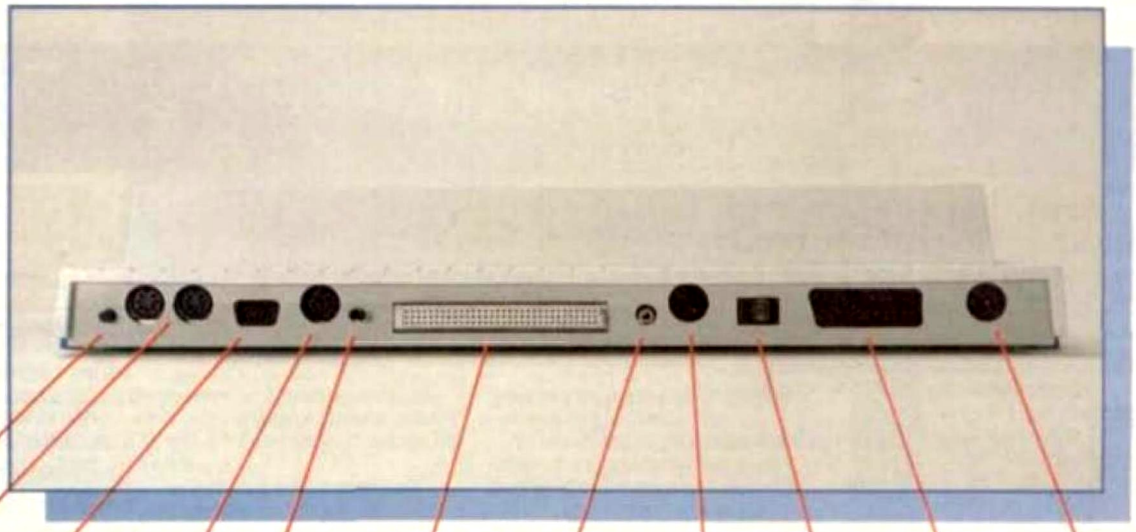


CLOSE UP coupé

A 72 key full-sized, full travel **Keyboard**, designed with a professional feel. The keys are "soft", allowing you to re-program and re-position them if you wish. On the right, there are 10 function keys, which double as a numeric keypad.

The basic model of the Coupé comes ready to work with software loaded from a standard cassette recorder. But you can also add one or two 1 MB 3.5" **Disk Drives**. These are ultra-slimline drives from Citizen in a special case which allows you simply to slot them in when you're ready.

The Coupé's slot-in disk drive



A SAM matter of FACT

The Coupé costs £169.95 (including VAT).

The Coupé will run most of your 48K (but not your 128K) software. Which titles? Ask the MGT Customer Care people.

And guess what? You can even change all the colours in your current games.

Watch out too for the brand-new Coupé-dedicated releases from US Gold, Codemasters, Activision....and the list is growing.

Where can you get the SAM Coupé? Well there'll be some in the shops before Christmas. Call the Customer Care department and they'll tell you where to go and what to do.

This is the basic model, and you can add on - just as soon as you're ready:

- 1 or 2 Disk Drives
- An extra 256K of memory
- Special communications interfaces - RS232 and parallel
- The MGT Mouse

And MUCH MUCH MORE.....

Ask MGT's Customer Care people.

The MGT Customer Care Team - and friends.

MGT Customer Care 0792 - 791100

Or send this coupon with a large SAE. Tick off the boxes.

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YS/3/90

1990

This Christmas, there's a little bit of Commodore in all of us.

Excitement, adventure, daring, call it what you will. The fact remains there's a little bit of it in all of us. That's why you should give a Commodore computer some serious thought this Christmas.

Take the new Amiga 1500. This powerful home computer gives you the ultimate in family entertainment. Screen images that will literally blow your mind and an impressive collection of leisure software . . . Battle Chess, Populous, Sim City and Their Finest Hour, the incredibly realistic Battle of Britain simulation.

Then, in an instant, it can switch to a serious business machine with Platinum Works, everything you need to work from home. Or to your own design/animation studio with Deluxe Paint III. The Amiga 1500 comes complete with 1 full Megabyte of RAM, keyboard, colour monitor and two built-in disk drives for only £1149.99.

Of course, the Amiga 500, recently awarded European Computer of the Year, is still the most coveted computer for kids of all ages. The Amiga 500 takes you into a fantastic world

The Commodore Amiga 1500 – £1149.99

"Now, let's see if I can ..."

of graphics, animation and sound. It has the power to educate, entertain, inspire and stretch the imagination like no other.

This year, look out for our 'Class of the 90's – First Steps' pack with 512Kb of RAM Expansion and a whole range of educational software; Deluxe Paint II, Pro Write 2.5, Infofile, Music Mouse, Let's Spell at Home, Amiga Logo with Talking Turtle and BBC Emulator. 'Class of

The Commodore Amiga 500. Screen Gems – £399.99* First Steps – £599.99*

"Yes, I'm learning fast ..."

the 90's' includes 10 free diskettes, mouse mat and introductory video. At just £599.99 it's a small price to help any child throughout their academic life.

And when class is over, there's our new Amiga 500 'Screen Gems' pack which includes Deluxe Paint II and four new challenges, each based on a blockbuster movie; Back to the Future II, Nightbreed, Shadow of the Beast II and the devastating Days of Thunder for only £399.99.

On the subject of fun and games, we present a totally new double pack for the C64, undoubtedly the world's favourite games computer. If brain-stretching tasks are your forte, choose 'Mindbenders' with Confuzion, Split Personalities and Trivial Pursuits. Or if it's pure escapism you prefer, there's 'Night Moves' with

The Commodore 64. Mindbenders and Night Moves – £159.99*

"I'll give it my best shot..."

the compelling Midnight Resistance, Nightbreed, Secret Agency Sly Spy and Shadow Warriors. The C64 computer comes with data cassette and two joysticks and is outstanding value at £159.99.

This Christmas, we are also proud to unveil the C64 Games System, a system built for one single purpose – having fun.

The C64 Games System is instant enjoyment for all the family and comes complete with annihilator joystick and four fun-filled games. When you've mastered Klax, International Soccer, Flimbo's Quest and Fiendish Freddy's Big Top, you can choose from another hundred. All this for under £100.

Every games cartridge for the C64 Games System is compatible with the C64 computer. And all Commodore machines, together with a complete range of peripherals, are available from any major high street store.

So whichever one of our computers you do choose, it's sure to bring out the best in your family. After all, there's a little bit of Commodore in all of us.

Call 071 873 9800 for details or send the freepost coupon below.

The Commodore 64 Games System – £99.99*

"I knew I could do it."

All prices are inclusive of VAT. *Monitor not included.

How much Commodore is there in you?

To find out, please complete your details and send them to Commodore, Freepost 38, London W1E 6PA.

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Commodore

12/CVG/A

UNDERNEATH THIS COMPUTER IS AN ARCADE FIGHTING TO GET OUT.

Underneath the respectable exterior of the new Amstrad Plus range of computers, lurks a monster.

And a few robots. And stacks of superheroes.

In fact, a whole arcade full of games just waiting to be played.*

Because even though the 6128 Plus and 464 Plus are both serious computers (with free 'BASIC' programming language) they're both ready for fun whenever you are.

Whether you choose the advanced, disk driven 6128 Plus or the cassette drive 464 Plus, you'll love the superb graphics palette, the stereo sound and your own paddle for total playing control.

Both computers also take instant loading ROM cartridges, so you get instant access to top rated games from the best software houses in Europe.

And they're both compatible with hundreds of CPC titles on disk and cassette.

You'll also get straight into the great high speed car game 'Burnin Rubber' because it comes free with your computer. Both models come complete with a choice of stereo monochrome or stereo colour monitor and a full sized keyboard.

So if your Amstrad starts acting like an arcade, don't worry. Just play along.

THE NEW AMSTRAD 6128 PLUS – FROM £329.

THE NEW AMSTRAD 464 PLUS – FROM £229.

AMSTRAD

FOR FURTHER DETAILS RING 0277 262326 OR FILL IN THE COUPON BELOW

Please send me details about the Amstrad 464 Plus and the Amstrad 6128 Plus. AA 11/90

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Send to: Amstrad plc, PO Box 462, Brentwood, Essex CM14 4EF. Tel: (0277) 262326.

*The PLUS range comes with the game 'Burnin Rubber' free on cartridge. Software subject to licence. Product subject to availability. RRP may change without notice. Amstrad, Amstrad 464 Plus and Amstrad 6128 Plus are trade marks of Amstrad plc. © Sept 1990 Amstrad plc. All rights reserved. Available from selected branches of Adams World, Allders, Clydesdale, Comet, Currys, Dixons and other leading stores.

SAM MISSION

STARDATE...JUNE 1990...
Disaster strikes as MGT crash-lands . . .
No obvious sign of life in the wreckage.

STARDATE... AUGUST 1990...
Commanders Bruce Gordon and Alan Miles discovered alive and well . . . SAM Coupé perfected for new mission . . . Team SAM assembled.

STARDATE...DECEMBER 1990...
Co-ordinates set for mission launch...

PRIORITY ONE MESSAGE...
SAM COUPÉ WITH 1 DRIVE
NOW **£199.95**

256K Memory - 780K Disk Space - 128 Colours - 6 Channel, 8 Octave Stereo Sound - Flash Art Package - Disk Utilities - Mouse Port - Joystick Port - Light Pen Port and Midi all included - Suitable for T.V. or Monitor.

...GET EXCELLENT SPECTRUM COMPATIBILITY WITH LERM'S SAMTAPE 3

LATEST SIGHTINGS:
Pipemania, Sphera . . . Personal Banking System . . . 1Mb Memory Upgrade . . . Card-cage and real-time clock.

MISSION OBJECTIVES: TO TAKE THE SAM COUPÉ TO EVERY CORNER OF THE UNIVERSE, SPREADING WISDOM, KNOWLEDGE AND PLEASURE...

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Comtazia - Walsall
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Scunthorpe Computer Centre
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Mag Components - Birmingham
Abbey Software - Spalding
Peterlee Computer Centre
Microtyne - Newcastle
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SAM Computers Limited, Lakeside, Phoenix Way, Swansea Enterprise Park, Swansea. SA7 9EH

1991

SAM MISSION

STARDATE... SEPTEMBER 1991...
SAM blasts into hyper-sales...

LAUNCH OF THE SAM 512K!!
Double the memory... Double the power...
£199.99 price retained

PRIORITY ONE MESSAGE SAM 512K WITH ONE DRIVE STILL

£199.99

New pack includes 512K memory and fabulous 4-disk software bundle + 780K disk drive (load software in seconds!) – 128 colours – 6 channel, 8 octave stereo sound – mouse/joystick ports – MIDI – suitable for TV or monitor. SPECTRUM SOFTWARE COMPATIBILITY WITH MESSENGER OR SAMTAPE 4.

LATEST SIGHTINGS
Prince of Persia (96% Crash Rating), Hexagonia, Comet Assembler, Outwrite Word Processor.

MISSION OBJECTIVES: TO TAKE THE SAM COUPÉ TO EVERY CORNER OF THE UNIVERSE, SPREADING WISDOM, KNOWLEDGE AND PLEASURE...

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SAM Computers Limited, Lakeside, Phoenix Way, Swansea Enterprise Park, Swansea. SA7 9EH

Now your money goes even further with Commodore.

There's a little bit of Commodore in all of us. Excitement and adventure, you saw it for yourself in our Christmas commercials. Now your money goes even further with Commodore.

Screen Gems with 1Mb RAM only £399.99

A huge leap in RAM for Amiga

Our Amiga 500 Screen Gems pack, the UK's most popular 16 Bit home computer has now doubled from 512K to 1 Megabyte of RAM. This gives even more power to educate, entertain, inspire and stretch the imagination. Yet it's still only £399.99, saving you almost £100.

Screen Gems also includes a mouse, Deluxe Paint II and four exciting challenges, including; Back to the Future II, Nightbreed, Shadow of the Beast II and the devastating Days of Thunder.

If you're looking for great Amiga value, you could even trade in your old computer for a fantastic world of graphics, animation and sound.

For just £329.99, you can now buy the Amiga 500 computer and modulator, saving you £70 on the normal price.

The C64 with joystick and games cartridge just £119.99

A spectacular fall for the C64

Undoubtedly, the world's best selling home computer, the C64 is now excellent value down from £159.99 to £119.99.

This month, the C64 brings instant fun for all the family and comes complete with joystick and games cartridge consisting of International Soccer, Klax, Fiendish Freddy's Big Top O'Fun and Flimbo's Quest.

All games cartridges produced for the C64 Games System are compatible with the standard C64 Computer. And all Commodore computers, together with a wide range of peripherals, are available at selected high street stores and at most independent computer retailers.

For full details of how you and your money can go to amazing lengths with Commodore, call 071 873 9800 or send the freepost coupon below.

All prices are inclusive of VAT.

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Commodore

THERE'S A LITTLE BIT OF COMMODORE IN ALL OF US

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